

STEEL

The Weekly Magazine of Metalworking

VOL. 129 NO. 5

JULY 30, 1951

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Editorial and Business Staff—Page 10. Advertising Index—Page 136. Editorial index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

Next Week . . . A More Realistic Measure of Shot Peening Effectiveness . . . Machine Tools Self-Controlled by Air Electric Gage System . . . Selecting Linings for Various Types of Service in Hot Metal Cars and Mixers

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year \$10; two years \$15; all other countries, one year \$18. Single copies (current issues) 35 cents. Metalworking Yearbook issue \$2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879. Copyright 1951 by Penton Publishing Co.

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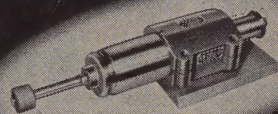
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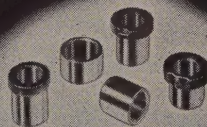
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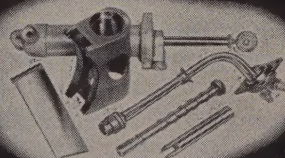
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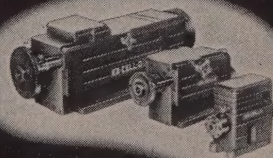
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Behind the Scenes...

Globaloney?

We note that Globe Slicing Machine Co. has moved to an office in New York just across from United Nations headquarters. To us that's an alarming juxtaposition. The Russians will probably comment on it in *Pravda*.

Happy Belated Birthday to Us

Well, it has happened. After years of forgetting Aunt Mabel's birthday, we have finally let our own slip by unnoticed. We should have commented on the event more than a month ago, for Shrdlu first burst into print—in little 6 point type—on June 10, 1935.

We're a little more than 16 years old now, a difficult time friends with teen-age children tell us. We should be pestering the old man to let us have the car, going out with girls more and talking for hours on the telephone. Come to think of it, we are talking a lot on the telephone.

Sidetracked

In looking over past "Behind the Scenes" performances, we wandered into the market section of STEEL somehow and began looking into 1941 prices. STEEL's price composite on finished steel in July of that year was \$56.60 per net ton. This month it's more than \$106. The composite per gross ton on scrap was \$19.16 just ten years ago. It's \$44 now. Ah, the good old days!

We've just counted them, and we're glad to report that STEEL carries 6149 separate price entries as a price and market reporting service for you every Monday. Those 6149 begin on page 108 this week and are 65 per cent more entries than carried by any other publication. STEEL carries 39 per cent more semifinished and finished steel entries than any other publication.

The Perils of Research

Speaking of wandering as we were in the previous item, we are reminded that wool-gathering is quite a problem with us whenever we are engaged in bookish research. When we look up a word in the dictionary, say "juxtaposition," we must keep a firm rein on ourselves not to wander down the column to learn that jynx is derived from the French, jynges, and means a charm or spell and that Jynx with a cap J is a

genus of woodpeckers consisting of the wrynecks.

But our real pitfall is the encyclopedia. We should have known better, but we looked up wrynecks in *Britannica* which archly describes the bird as a "summer visitant to most parts of Europe, generally arriving a few days before the cuckoo." After that we were hopelessly lost and wandered down the page to Wuhu, which is a Chinese port in Anhwei province on the south bank of the Yangtze river.

Cover Story

Eagle-eyed readers familiar with electric steelmaking will note that our cover this week carries a picture of a side-charged electric furnace, not the more modern top-charged unit. The problems of fumes and lighting have to date thwarted even the most intrepid photographers in trying to shoot the top-charged furnace. The editors simply couldn't find or have taken a satisfactory shot, so they had to make do with the side-charged job.

Knowing photographers, we have a hunch some of them will soon solve the problems. In fact, we would hesitate to bet that a superlative shot won't be forthcoming within a week after this is published.

The story to which the cover refers begins on page 74 and is STEEL's appraisal of what's ahead in electric steelmaking.

Puzzle Corner

Charley and Joe, wishing to determine the weight of a fish they had caught on the French river in Canada, balanced a plank on a fence, and then balanced each other on the plank. They then exchanged places, but this time Charley, the lighter man, held the fish in his lap. They found the plank balanced again. If Charley weighs 150 pounds and Joe 180 pounds, what did the fish weigh?

E. Buschow of Surface Combustion Corp., Robert W. Huff of Canton, O., and C. E. Blass of Talon Inc. were the first in with the correct answer to the hat-in-the-river problem of July 16. The river current flowed two miles per hour.

Shrdlu



July 30, 1951

Broader Base

Without fanfare, electric steelmaking has advanced to second place among steelmaking processes. Output of electric steel exceeded that of bessemer for the first time in 1948, fell behind in 1949, regained the lead in 1950 and is far ahead in 1951.

This ascendancy of electric steel reflects the constant shift among steel-making processes that has been going on ever since steel replaced iron. Late in the nineteenth century bessemer steel was first, open-hearth steel was second and crucible a poor third. Bessemer rose to its peak year of 13,748,930 net tons in 1906 and crucible climbed to its pinnacle of 146,982 net tons in 1907. Bessemer has declined steadily since then, except for a moderate revival in recent years. Crucible tonnage faded to the point that its output is ignored by official statistics.

Meanwhile, open-hearth steel was gaining rapidly. It overtook bessemer in 1908 and its margin has increased steadily until in the first half of 1951, open-hearth steel was produced at an annual rate of 92,875,100 net tons, against 4,741,770 tons for bessemer. During the first half, electric steel output was at the annual rate of 6,929,016 net tons—an excess of 2,187,246 tons over bessemer, or 46 per cent.

The rapid gain in electric steel is significant. One salutary aspect is that it provides hope for nonintegrated steel operations. For years we have heard people say that the steel business is open only to those who have unlimited financial resources and that the day of the nonintegrated company has passed. Some individuals never have accepted this death sentence. Scores have written that there must be some way for the competent operator with limited finances to enter the steel industry. Many of them base this hope upon the flexibility of the electric furnace.

Economic conditions of the day lend strong support to this line of reasoning. The acute need for steel encourages the quick expansion offered by the electric furnace. If this results in a healthy, sound diffusion of steel capacity among nonintegrated units, widely distributed geographically, so much the better.

EDITOR-IN-CHIEF

CMP IS IN TROUBLE: National Production Authority's Controlled Materials Plan, upon which steel consumers were relying in the hope that it would provide a more equitable

distribution of finished steel, is off to a bad start. Increasing numbers of buyers holding CMP tickets cannot cash them. Mills which already have allocated all of their September ton-

nage are forced to turn down CMP tickets right and left.

This would indicate that something is radically wrong. NPA officials not only are adopting drastic measures in attempts to relieve the September situation, but they also are trying to find out what went wrong so that the mistakes will not be repeated in the handling of rated orders and CMP tickets for fourth-quarter steel.

Distributing steel under present conditions is admittedly complicated, but there is little excuse for issuing tickets for more steel than is available. For their own protection and in justice to steel buyers, NPA officials should not rest until they have found the root of the trouble and have corrected it.

—p. 35

* * *

RED TAPE UNLIMITED: For many years, the metalworking industry has relied upon certain statistics put out by the Department of Commerce and in the main they have been fairly accurate and have been made available promptly. Today these reports are coming out several months late. This reduces their value considerably.

Why this breakdown? It is due largely to the fact that the government in its pyramiding of agencies dealing with mobilization, is questionnairing industrial companies to the limit. The over-taxed office forces of the nation's manufacturing establishments are so busy providing answers to endless bureaucratic questions that the replies to normal statistical requests have to be sidetracked. We wonder how much of the requested information would be declared useless and unnecessary if a competent over-all supervisory authority were in charge of the government's bureaucracy.

—p. 42

* * *

DOWN FROM YEAR AGO: For the first time since March, 1950, this publication's index of industrial production has failed to exceed the level of the corresponding period a year ago. This has occurred in two consecutive weeks. In the week ended July 14, the index stood at 206 per cent of the 1936-1939 average, compared with 209 in the corresponding week of 1950. In the week ended July 21, the 1951 figure was 211 against 214 in the 1950 week.

Unfavorable comparisons with figures for a year ago are likely to continue. The index is based upon four factors—steelworks operations,

electric power output, freight car loadings and automobile assemblies. Government restrictions are holding automobile output to lower levels. Freight car loadings are off slightly from a year ago. Electric power output and steel operations, while at extremely high levels, henceforth will be competing with the sharply rising activity of the midsummer weeks last year which followed the attack on South Korea.

—p. 53

* * *

FUTURE NOT TOO BAD: Mechanical rubber has become a full-fledged, important industry. It consists of about 500 companies, which up to a month ago were producing at a rate slightly above the very satisfactory pace of 1950. In recent weeks the industry's outlook has been clouded by the receding demand for mechanical rubber goods by the consumer goods industries.

This decline will be offset in part by the rising consumption for defense requirements. The military needs flexible gas tanks, tank track blocks, bushings, hydraulic and other types of hose for aircraft, de-icers for aircraft and automotive products adaptable for military use.

Important is the fact that 900,000 tons of synthetic rubber is being produced monthly against 300,000 to 400,000 tons a year ago. Release of a fraction of the government's stockpile of natural rubber would help the rubber people.

—p. 37

* * *

CERAMICS AND STEEL: During the past several years the literature of the metalworking industries has touched occasionally upon the possibility that ceramics bonded with steel may be one answer to the problem of providing components that will stand up to high temperature punishment in jet engines. The United States Bureau of Standards has conducted valuable research in this direction and a few manufacturers have worked hard on the problem.

One of the latter—Solar Aircraft Co.—has developed a process of dipping conventional stainless steels into a ceramic frit and firing them at 1300-2400° F. The resultant ceramic-coated component will withstand temperatures of 1800° F. Probably more important is the fact that this procedure permits the use of conventional stainless steels instead of alloys containing large percentages of critical nickel, chromium, cobalt and tungsten.

—p. 66

CMP Gets Off on the Wrong Foot

NPA allotted too much steel in September and many users can't cash their CMP tickets. Officials are hunting the error so fourth quarter allocations will be correct

THE CONTROLLED MATERIALS Plan is off to a bad start.

Large numbers of consumers all over the country report they can't cash in their CMP steel tickets for September because the mills are already booked up. National Production Authority officials in charge of CMP admit that something's radically wrong. Mills are turning down CMP tonnage right and left and telling consumers to try some other producer.

Stop-Gap—As a last-minute measure to try to bring some order to the chaos in September steel distribution, NPA last Wednesday instructed all steel mills to increase set-asides of their September production of certain carbon steel products for rated orders. The products are reinforcing bars, nails and staples, barbed and twisted wire, wire fence and wire net, on which set-asides for rated orders are now 95 per cent. That compares with the present percentage of 70 per cent in reinforcing bars, 90 per cent on nails, staples, barbed and twisted wire fence and 75 per cent on wire net. Set-asides for rated orders also have been increased for stainless steel—to 100 per cent from 75 per cent on ingots, to 90 from 50 on blooms, slabs and billets, to 100 from 75 on sheet bars and to 100 from 50 on hot-rolled strip.

NPA officials are also busy on a scheme to stretch out the supply for rated orders by making an across-the-board slash in all CMP allotments for September except direct military. Announcement of such a cut may come out momentarily.

Too Late—Actually those measures for the September allotments will come too late for any far-reaching relief. The stark fact is that those consumers who got their CMP tickets late and thus found the steel mill books already closed for September are out of luck as far as steel for that month is concerned. Many plants may have to shut down all or part of the month with enforced vacations for thousands of employees.

NPA people are working now to figure out what went wrong in the September allotments, so they can correct the error by the time the fourth-quarter allocations are fixed,



NPA IN A QUANDARY

... something's radically wrong

a job originally scheduled to be completed by Aug. 16.

Up in the Air—Also uncertain is the fate of the "free" steel which was supposed to amount to 15 per cent of total September production. NPA still wants to leave that proportion untouched, but its tinkering with the set-asides for the month are bound to cut into free material. Thus far, no unusual complaints have come from consumers who must rely on that free metal.

The irony is that some users with unhonored CMP tickets can't buy the free metal. Many of them are large consumers whose requests took a long time for processing in Washington. As a result, they were late in presenting their allocations to steel companies who took the rated orders on a first-come first-served basis.

Inland Reports on Conversion

Conversion business comprised 14 per cent of Inland Steel Co.'s total mill shipments of steel during the second quarter of this year.

Present commitments indicate it will continue at about that rate during the current quarter.

During the first quarter, conversion reached a new high level with Inland and represented 16 per cent of its total mill shipments.

Under conversion arrangements, raw and semifinished steel supplied

by customers is rolled into finished products for them.

Inland officials declined to predict how long the demand for steel will exceed supply. It is not possible, they say, to estimate to what extent current demand is induced by confusion from widespread governmental controls and the predictions from Washington of continuing scarcities.

Half Way on Expansion

Columbia Steel hopes to have its Pittsburg, Calif., project finished next April

COLUMBIA Steel Co., West Coast subsidiary of U. S. Steel Corp., has passed the half way mark in the construction and equipping of its second sheet and tin plate mill at its 400-acre plant site in Pittsburg, Calif.

Last of the equipment is expected to be installed by next April, J. D. McCall, general superintendent, told STEEL. He said this will be the continuous galvanizing line, which, he declared would be the first one of its kind west of Gary, Ind.

Up and Up—When completed, Columbia will have processing capacity for 350,000 tons of tin plate and 192,000 tons of steel sheets. At present the annual capacity is 200,000 tons of tin plate and 125,000 tons of sheets, the total of the two being cold rolled on one 56-inch, five-stand mill.

The second mill now being installed will be of four stands and will be devoted exclusively to the cold rolling of sheets, leaving the other mill free for processing tin plate. Besides the added capacity, the new mill will save time lost in switch-over procedure.

All in the Family—The hot-rolled steel coils are supplied to Columbia by Geneva Steel Co., another U. S. Steel subsidiary, in Provo, Utah, leaving Columbia's open-hearth furnaces and rolling equipment available for production of other steel products, including steel wire, nails, wire fencing and wire rope.

Considerable water seepage problems had to be licked before the foundation for the new buildings could be laid. The plant is near the bay and much of the hundreds of miles of conduit for lubrication, coolants and electrical wiring and complicated electrical systems and intricate machinery lay in tunnels and rooms far below sea level. Excavation levels run as much as 60 feet below the surface.

Columbia Gets Tramway Division

U. S. Steel's Columbia Steel Co. has established a tramway division,

the only one of its kind in the corporation.

It is in a position to bid all jobs completely erected as a prime contractor for projects anywhere in the U. S. Foreign projects will be bid through U. S. Steel Export Co. The tramway division was attached originally to Trenton Iron Co. and subsequently to the U. S. Steel subsidiary, American Steel & Wire Co.

Canada Places Defense Orders

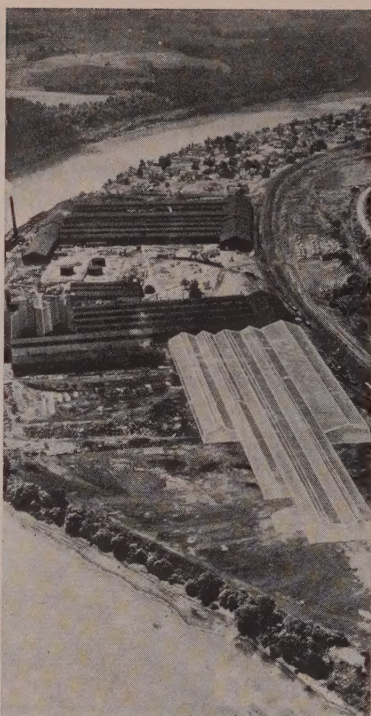
Canada's Defence Production Department reported that orders totaling \$60 million were awarded during June.

Among the larger orders placed were, \$17,107,000 to Canadian Wright Ltd., Montreal, for aircraft engine repairs and modification; \$4,883,000 to Chrysler Corp. of Canada Ltd., Windsor, for vehicles; \$12,281,000 to General Motors Products of Canada Ltd., Oshawa, for vehicles and parts and \$2,065,000 to Standard Aero Engines Ltd., Winnipeg, for aircraft engine repairs.

Houston: Rising Southwest Star

Gaining rapidly in the Southwest as a metalworking center is Houston: If sales of metal goods in the area continue to rise for the rest of the year as they have for the first six months, total sales will probably reach \$400 million. And the payroll for the 28,400 persons in metal manufacturing may reach an alltime high of \$100 million.

In 1947, when the last U. S. Census of Manufactures was released, Hous-



PROJECTION: This aerial photo shows the 38-acre plot on the Monongahela river at Allenport, Pa., where Pittsburgh Steel Co.'s new 66-inch, 4-high continuous strip mill will be built. Buildings that will house the mill are sketched in to show what the site will look like when completed next year

ton had 259 metalworking plants, employing 22,541 persons; today metropolitan Houston has 308.

Continuous Annealing at Gary

Just placed into operation at the tin mill division of United States Steel Co.'s Gary, Ind., Sheet & Tin mill is a line that makes possible continuous annealing of steel for tin and black plate products. Plate in varying thickness—18 to 37 inches wide—can whip through the line at 1000 feet per minute.

Construction of the line started a year ago. It is housed in a new building 336 feet long; ceiling height is 76 feet. The furnace section, equipped with combination gas and electric heating units, is almost 64 feet above the plant floor.

To give tin plate the pliability necessary for forming into cans, the plate must be annealed (after cold reduction, tin plate is stiff and unyielding). The installation is part of the overall program started by U. S. Steel to increase the productive capacity of the Gary mill. It did. Rated capacity of the line is 136,000 tons annually.

Certificates for 114 Facilities

Certificates of necessity for accelerated tax amortization of 114 more new or expanded defense facilities were approved by the Defense Production Administration during the week of July 13-20. Amount eligible for rapid depreciation on those certificates is \$229,015,498.

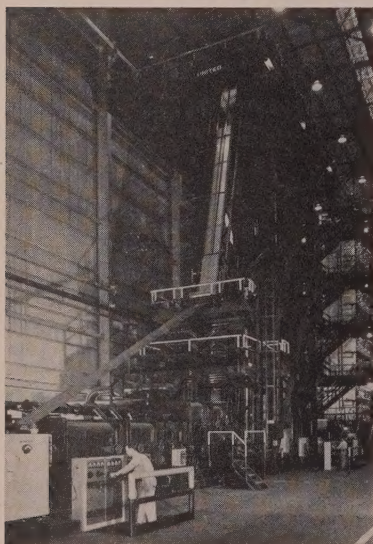
With this latest tabulation, rapid tax write-off has been authorized for a total of 2793 new or expanded facilities. Total amount of tax amortization certified on these facilities is \$8,335,472,305.

Emergency Loans Granted

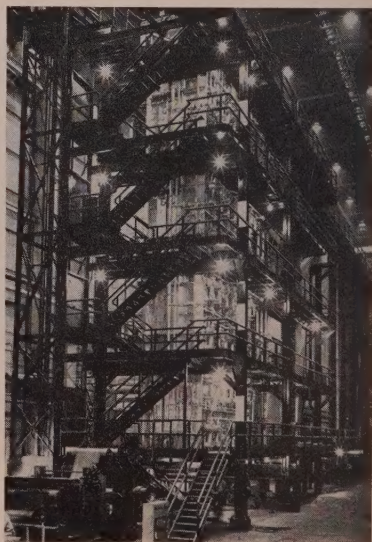
Fifteen additional emergency loans totaling \$9,806,378 for expansion of industrial facilities needed for the defense effort were authorized by the Defense Production Administration between May 28 and July 18.

These are in addition to 33 loans authorized between Dec. 18, 1950, and May 14, 1951. Total amount of all loans issued to date is \$70,627,882.

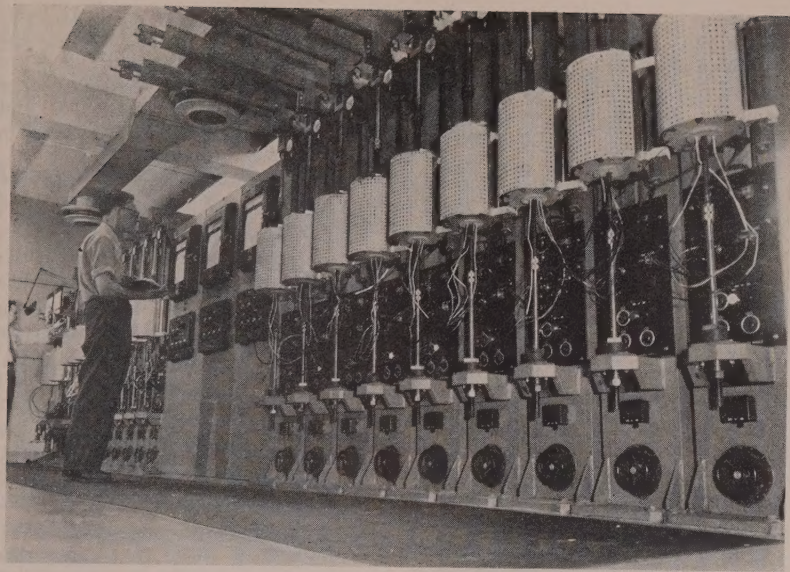
Among companies in the latest list of loan recipients are: S. K. Wellman Co., Cleveland, \$3.8 million; Tyson Bearing Corp., Massillon, O., \$1,275,000; Stover Lock Nut & Machinery Corp., Easton, Pa., \$349,000; C. G. S. Laboratories Inc., Stamford, Conn., \$35,128; Schwen Engineering Co., Los Angeles, \$398,500; Electronic Associates Inc., Long Beach, N. J., \$150,000; Aircraft Products Co., Clifton Heights, Pa., \$175,000; and Lucerne Coke Co., Indiana, Pa., \$2,200,000.



GARY SHEET & TIN MILL
... five stories to annealing line



VIEW OF FURNACE SECTION
... 64 feet in height



TESTING—THE WORKS: National Tube Co. spared little in setting up its new laboratory in Pittsburgh for testing materials and researching problems. The entire third floor of the three-story-and-basement building is for electronic measuring. Standard equipment is available for Vickers, Brinell and Rockwell hardness testing. Even mill safety hats and safety shoes can be tested in the lab. Here, 18 lever-type creep stands provide data for determination of elevated temperature properties of steels used in the manufacture of tubular products

Less Bounce in Rubber Goods Sales

Declining demand from manufacturers of consumer durables brings a slight lull, at a time when more synthetic rubber is becoming available

THE STRETCH is easing in hitherto tight supplies of mechanical rubber goods.

Two factors are taking the strain off manufacturers of the products for industry: Declining demand from makers of consumer durables and more synthetic rubber.

The Slack Comes—Up until a month or so ago, the 500 makers of mechanical rubber goods were producing at a rate slightly above 1950's fast pace. Demand was sustained because of rubber needs in the plant and equipment expansion program, because of the defense program which was taking about 10 per cent of the industry's production and because of the continued high output of refrigerators, automobiles and other consumer hard goods. The first two factors have shown little change, but the demand from consumer goods makers is softening like a deflating balloon.

Men in the industry expect the slack to continue for a while until defense volume expands, perhaps to 25 per cent of the industry's total sales by the end of the year. The major defense applications for mechanical rubber goods include flexible

gas tanks, tank track blocks, bushings, hydraulic and other types of hose for aircraft, de-icers for aircraft and much of the range of civilian automotive products adapted for military use.

Synthetics to the Rescue—When defense requirements pick up, the industry will be able to handle fairly easily both the military and civilian work because of the rapidly increasing expansion in synthetic rubber production at Reconstruction Finance Corp.'s plants. Output now is actually higher than at any time during World War II, not because of any facility expansion but because of greater efficiency in production. Some 900,000 tons of synthetic rubber is being turned out a month now, compared to 300,000 to 400,000 tons monthly less than a year ago. Isolated companies don't have enough rubber yet, but the situation is much better than just a few months ago. There would be no trouble at all if the U. S. would release some of the natural rubber from its stockpiles.

Some 50 companies account for 85 per cent of all the business done in mechanical rubber goods. The industry offers about 30,000 different

items, considering all the sizes and specifications. The rubber product whose sales account for the largest dollar volume is probably belting. Largest users of mechanical rubber goods include the automotive industry with its need for grommets, v-belt and various molded and extruded parts; the mining industry which uses large quantities of belting; and the oil and gas industry, the heaviest consumer of rubber hose.

Titanium in Triplicate

Three developments, all in the Cleveland area, spell greater commercial use of the metal

THREE CURRENT developments may make Cleveland a major titanium-producing center.

Chase Brass & Copper Inc. plans an \$18 million expansion of two plants in Euclid, O., a Cleveland suburb, reportedly to roll titanium sheet and strip. Steel Improvement & Forge Co., Cleveland, will pioneer in commercial production of titanium forgings and has on its books orders amounting to more than \$1 million for forged titanium parts. Newly formed in the city is Horizons Titanium Corp. which will produce the metal by a new, cheaper process.

Unconfirmed—Chase officials will neither confirm nor deny that they plan to roll titanium. Chase is a subsidiary of Kennecott Copper Corp. which also owns an interest in Quebec Iron & Titanium Corp. Quebec was formed in 1948 to develop titanium ore. The ore is already being shipped to a smelting plant at Sorel in Quebec. Finishing facilities in Cleveland to handle the smelted product make sense.

Despite the Cost—Steel Improvement will produce commercial titanium forgings in spite of the metal's high cost primarily because the forging is equal in strength to stainless steel but weighs little more than aluminum. Although Steel Improvement won't say so, the titanium forgings will probably be used in jet aircraft for the Air Force. Every jet engine requires from 2000 to 3000 parts where both extreme strength and high heat resistant qualities are required. Aluminum can't stand the heat, so stainless steel has been used freely up to now. The weight saving over steel offered by titanium forgings in military aircraft will mean more fuel for longer range.

New Method—The New Horizons Titanium Corp. hopes to do something about the cost of the light metal. Backed by Horizons Inc., an industrial research group, and Ferro Corp., Cleveland, the company will use a new production process developed by

Horizons (STEEL, July 9, p. 55). It wants to bring the cost of titanium down to \$1 a pound from the present cost of \$5 a pound for sponge and \$7 a pound for ingot.

June Tool Output Rises

Machine tool shipments in the month hit the highest volume since January, 1944

MACHINE TOOL shipments, continuing to grow in June, reached their greatest volume since January, 1944, and helped make second-quarter shipments the largest since the first quarter of 1944.

Preliminary total of June shipments is 183.5 per cent of the average shipments of 1945-1946-1947, the National Machine Tool Builders' Association, Cleveland, reports. For May, the figure was 175.1.

New orders in June were up over May but did not equal those of February or March. In June, new orders were equal to 567 per cent of the shipments average for 1945-1946-1947. In May they were 483 per cent; in February, 615.5; and in March, 590.3.

But More Are Needed—Even though machine tool shipments are on the upgrade they must be increased sharply to meet anticipated needs of the mobilization program, the National Production Authority told the Machine Tool Manufacturers Industry Advisory Committee.

Meanwhile, the General Services Administration announced it is ready to make advances to machine tool manufacturers to assist them in the prompt performance of government machine tool pool orders. Advances up to 30 per cent of their pool orders will be made to manufacturers unable to obtain private financing on reasonable terms, without or with a government guarantee of the loan. Interest of 4 per cent a year will be charged.

Not Enough—Even if the machine tool industry is able to double its output in the next 12 months the increased production would still be inadequate to meet needs of the mobilization program, NPA said.

Industry spokesmen, pointing out that the industry's present capacity is about one-third of what it was at the start of World War II, emphasized that expansion of its productive capacity will require one or more of the following aids:

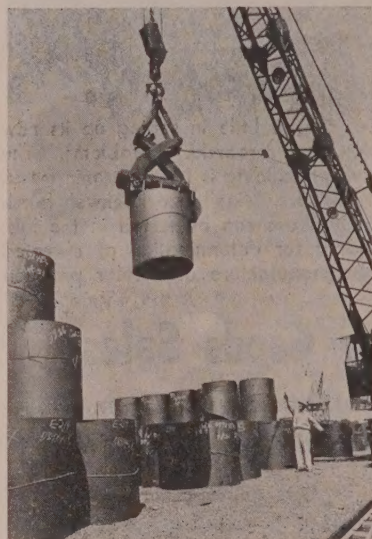
1. Super-priorities for materials, facilities and tools.
2. More skilled labor and assurances that war plants will not be permitted to "pirate" employees from machine tool plants.
3. Adequate financing to pay for

expansion and provide greater working capital.

Don't Fill the Bill—The present certificates of necessity program is not adequate for machine tool builders, their industry advisory committee declared.

Some form of increased depreciation for tax purposes should be allowed also for plant equipment used in two and three-shift operation, they said.

The committee also criticized the government's charge of 4 per cent interest for advances to finance machine tool pool orders. Such advances, they pointed out, were made during World War II without interest.



TONG LASHING: Coils of strip weighing 10 tons are handled easily at Ford's Rouge plant by the massive tongs designed for the job by Heppinstall Co., Pittsburgh. Besides delicately handling the coils so as not to damage the edges, the tongs eliminate the need for a ground crew. Signalman in the picture merely spots the location for the crane

Utilities Fear Short Circuit

Privately owned power companies fear a setback in their five-year continuing expansion to add a 50 per cent increase to their capacity unless manufacturers of electrical generating and transmission equipment are allocated enough steel, copper, aluminum and alloy metals to keep up with the construction plans of the industry, according to George M. Gadsby, president of Edison Electric Institute.

Mr. Gadsby, also president of Utah Power and Light Co., said in a San Francisco speaking engagement that the present government policy of al-

locating critical materials may hamstring the electric power industry's \$15 million expansion program. This is the amount intended to be spent during the five years ended with 1954 and designed to bring generating capacity up to 100,500,000 kilowatts.

If the manufacturers do not get the materials, he won't guarantee there won't be a power shortage.

Alaskan Storehouse

The territory's rich resources could solve some of industry's raw material shortages

ALASKA'S untapped natural resources may be a partial answer to some of American industry's raw material shortages.

That's one of the conclusions that can be drawn from an Alaskan Resource Development report presented to Congress by Secretary of the Interior Oscar L. Chapman.

Rich—Alaska has deposits of mercury, chromite, platinum, tin, tungsten, zinc and antimony. There are possibilities for significant discoveries of oil and the territory contains deposits of building and construction materials to meet many of its own growing needs.

But Alaska, the report says, is richest in waterways which could produce about 50 billion kilowatt-hours of energy a year. The area's industrial future may flow from the development of hydroelectric power, costing less than 3 mills per kilowatt-hour. There are only a few undeveloped sites in the U. S. proper capable of generating energy at such low cost. That has resulted in light metal producers turning toward Canada. Alaskan hydroelectric development may tie in closely with contemplated industrial expansion in the adjoining northwestern regions of Canada. It's possible that a large portion of that Canadian area's mineral resources could be shipped to tidewater Alaskan plants for smelting, processing, manufacturing or marketing.

The Key—The report cites electric power as the key to the economic feasibility of extracting many of Alaska's minerals. The first federal power plant in Alaska is under construction at Eklutna Lake to provide energy for the Palmer and Anchorage areas. Reconnaissance studies in the territory indicate that there are at least 72 potential sites for generating plants in Alaska—for an installed capacity of 2.2 million kilowatts in the southeastern part of the territory, 3.3 million kilowatts in the south central region, 2.6 million in the Yukon-Kuskokwim area, 35,000 in the Sew-

ard Peninsula region and 225,000 in the Arctic area.

The report recommends that the federal government take "the responsibility to develop those resources."

Domestic Manganese Sought

Strained international relations between the United States and Russia have brought about another move by the U. S. government to obtain manganese to make up for the loss of supplies from the Iron Curtain area.

The General Services Administration says it will carry out a five-year domestic manganese purchasing program to encourage the discovery, development and production of manganese in this country. Under the program the government will buy manganese ore from miners at three depots being set up by GSA at Butte and Philipsburg, Mont., and Deming, N. Mex.

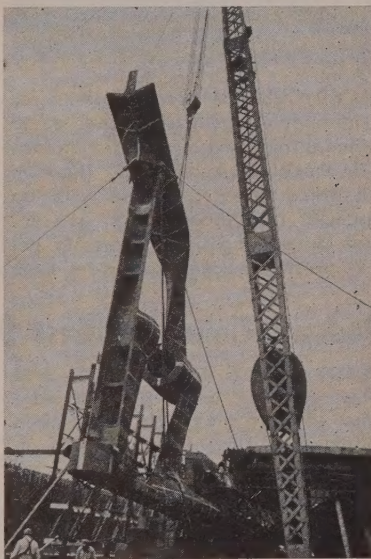
Progress Report on Lake Boats

A major step in the progress of two new giant ore carriers—the placing of 96,000-pound stern frames—is reported by W. C. Hemingway, president of Pittsburgh Steamship Co., ore-carrying subsidiary of U. S. Steel Corp.

The towering pieces of steel framework were set in position at the Lorain, O., yards of American Ship Building Co., builder of the vessels. A similar point in construction progress will be reached shortly at the Detroit yards of Great Lakes Engineering Works where the third of three new 647-foot boats is being built for addition to the Pittsburgh

Steamship fleet of 61 vessels. All are scheduled for launching this fall and for delivery in time to start hauling ore from upper lake ports to furnaces at lower lake ports at the start of the 1952 shipping season.

Hull structure for the first boat being built at Lorain (the keel was laid Dec. 18, 1950) is about 65 per cent completed. The other two hulls, on which work started some weeks later, are 50 and 45 per cent completed. Besides the three ore carriers, a new limestone carrier—a 666-foot self-unloader—is being built at Manitowoc, Wis., for Bradley Transportation Co., another U. S. Steel subsidiary.



96,000-POUND STERN FRAME
... progress at Lorain, O.

Subcontract Clinics: More Business for Small Business

AS A BUSINESSLIKE means of getting prime and subcontractors together, the simple yet functional exhibitors' booths set up at the Cleveland Central Armory last week for the Armed Forces Procurement Clinic was a top-drawer idea. Engineers and purchasing executives present in all of the booths were able to figure and quote on jobs on-the-spot. And they did. For many subcontractors the groundwork was laid for contracts in the near future.

Over 80 important contractors in the Ohio-Indiana-Michigan-Kentucky orbit had booths. There they displayed hundreds of actual parts and subassemblies and thousands of blueprint specifications that they wanted to subcontract to qualified businesses. Components ranged all the way from microscopic parts for electronic instruments to massive castings and

forgings for tanks, big guns, aircraft landing gear and ships.

Avowed Purpose—"More Business for Small Business" was the purpose of the clinic. And the more than 1500 potential subcontractors who milled around in the armory each of the four days (July 24 to 27) that the clinic was being conducted got some of the business. Smaller operators with graphic proof of their facilities and abilities were able to tuck jobs away right at the clinic.

Subcontract clinics are by no means over. Another one will be held in Pittsburgh Aug. 15 to 17 at Hotel William Penn. Again, representatives of the Army, Navy and Air Force will sponsor the get-together. Admiral Ben Moreell, president and chairman of the board, Jones & Laughlin Steel Corp., will be chairman of the advisory committee. In Cleveland, for

last week's clinic Robert A. Weaver of Ferro Corp., Cleveland, was honorary chairman.

Still other clinics on the immediate schedule: In St. Louis, at Kiel Auditorium, July 30 to Aug. 3; in Atlanta, at the Biltmore Auditorium, Sept. 10 to 12; in Los Angeles, at Hollywood Turf Club, Sept. 18 to 21.

Blast Furnaces Exceed Capacity

June was the second consecutive month that blast furnace production in the United States exceeded 100 per cent of capacity. June's rate was 100.2 per cent; the May rate was 100.3 per cent.

Because June has one less day than some of the earlier months of the year the production that month was not as great tonnagewise as that of some of the other months. In June, pig iron output was 5,919,735 net tons and yield of ferromanganese and spiegel was 57,921 tons making a total blast furnace production of 5,977,656 net tons, the American Iron and Steel Institute reports.

More Benefits for Steel Workers

Social insurance benefits to employees of U. S. Steel Corp. are being expanded by an estimated \$4 million annually in agreements being concluded with the CIO United Steelworkers.

Unpublicized negotiations between the corporation and the union have been going on for months within the framework of their present insurance and pension agreement. The added benefits—surgical—will be added to the present life, accident and sickness insurance for employees and hospitalization benefits for employees and dependents at no extra cost to the employer or employee. The first year's experience under the program developed a surplus and the negotiators determined that additional benefits could be provided.

Reserves now are said to total about \$8 million, twice the amount deemed to be the minimum. About 220,000 employees now are covered by the U. S. Steel-CIO social insurance program.

Alcoa Plans New Smelting Plant

A new aluminum smelting plant, the first in history to use lignite for fuel is planned by Aluminum Co. of America. Alcoa applied to the Interior Department for a certificate of necessity to build the plant soon at one of several alternate locations about 60 miles south of Waco, Tex.

The plant, which will have a pro-

duction capacity of 85,000 tons of aluminum annually, is expected to start operating early in the fall of 1952.

Opportunities Galore

New opportunities for companies wanting to add to their product lines continue to be presented in volume in the "Register of Patents Available for Licensing or Sale." They appear in each issue of the Patent Office's *Official Gazette*. The issue of June 23 had a list of 89 General Electric Co. patents on electric washing machines and ironing machines, and parts and controls for same. Also listed were a new chucking device for lathes, a nut pickup device, a heat retaining curtain. The July 3 issue listed 26 Atomic Energy Commission patents now available for licensing; three cutting-tool patents of GE's Carboly Department; two furnace patents of Salem Engineering Co., Salem, O.; and 304 miscellaneous patents owned by General Electric Co.

Memo to Purchasing Agents

Purchasing agents, unlike domestic consumers, are subject to sanctions under the Defense Production Act of 1950 unless acting in good faith.

So says Harold Leventhal, chief counsel of the Office of Price Stabilization, writing in the National Association of Purchasing Agents' *Bulletin*. "The act," he writes, "is specifically made applicable, in terms of prohibitions, to any person who purchases, in the course of trade or business, in violation of the regulations. The buyer is not subject to the treble damage provisions, but he is subject to the other sanctions of the act, from injunction suits to criminal prosecution in cases of wilful violations."

RFC OK's 3 Loans, Vetoes 43

Reconstruction Finance Corp. becomes more selective each week in granting loans to business. In the week ended July 11, the lending agency approved three, amounting to \$1,950,000, but turned down 45 other applicants who would have borrowed \$2,556,201.

The small number of loans reported reflects the change in procedure that shifted lending authority from field offices to Washington headquarters on all loans. Only eight applications have been approved since this policy went into effect June 27.

Heckethorn Mfg. & Supply Co., Littleton, Colo., got the week's biggest grant of \$1.5 million. Other loans went to Ward Body Works Inc., Denver, \$100,000; and to Jayval Mfg. Co., Conway, Ark., \$150,000.



CLOSE CHECKS: Raw forgings for a jet engine part must be checked to within a tolerance of 0.001 of an inch—or the piece is rejected. Here an Air Force inspector checks with an inspector of Allison Division of General Motors who uses calipers to get the precise measurements on them

Packard Claims It Must Double Number of Suppliers

SOME SMALL BUSINESSES still shut out of defense and defense-support activity may find jobs when automakers finally begin work on contracts awarded months ago. One example is cited in the case of Packard Motor Car Co.

More than twice its present number of suppliers will be needed by Packard when its combined civilian-military program gets under way. Presently buying from 1100 firms, R. R. Rees, director of purchases, states that about 2500 suppliers are going to be required for its performance on the Air Force J-47-GE-23 jet en-

Defense Loans Top \$500 Million

Defense production loans totaling \$514,500,000 were authorized by guaranteeing agencies through Federal Reserve banks from September, 1950, through May, 1951. Program for guaranteeing defense production loans is authorized under Regulation Five of the board of governors of the FRB.

Financing institutions advanced \$286 million on guaranteed loans in this period. Of this total, \$102.4 million was repaid, leaving an unpaid balance of \$183.6 million on May 31.

World Congress To Hear Wilson

Defense Mobilizer Charles E. Wilson will be the major speaker at the closing session of the World Metallurgical Congress in Detroit, Oct. 19. He'll speak on the strategic importance of world metal conservation and production to free world defense.

The Metallurgical Congress—first of its kind—is sponsored by the American Society for Metals and will be held concurrently with the society's National Metal Congress & Exposition. The Wilson meeting will be staged in the Statler Hotel.

gine contract and the \$20 million Navy contract for Packard-designed marine diesels.

A new order that adds \$55 million to a previous commitment for howitzer motor carriages at Massey-Harris Co. should provide opportunity for additional subcontractors. . . . York Corp., York, Pa., has a long-term Navy contract valued at \$2.5 million to build large naval aviation rocket motors. . . . Robertshaw-Fulton Controls Co. had \$20 million in defense orders on hand on July 1.

More contracts, awarded by the government, follow:

PRODUCT	CONTRACTOR
Bomb and Torpedo Trucks	American Chain & Cable Co. Inc., York, Pa. Lewis-Shepard Products Inc., Watertown, Mass. Gray Iron Casting Co., Mt. Joy, Pa.
Locomotives, Diesel Electric	Davenport Locomotive Works, Davenport, Iowa
Railway Cranes	Industrial Brownhoist Corp., Bay City Mich.
Gasoline Engine Driven Blowers	American Air Filter Co. Inc., Moline, Ill.
Ground Portable Heaters	Airesearch Mfg. Co., Los Angeles Hepner Mfg. Co., Round Lake, Ill.
Compressors	Cornelius Co., Minneapolis
Air Compressor and Dryer Units	Poole & Kent Co., Baltimore
Motors	W. L. Maxon Corp., New York
Signal Generators	Starrett Television Corp., New York Lavie Laboratories Inc., Morganville, N. J. Federal Fg. & Engineering Corp., Brooklyn, N. Y.
Radar Training Sets	Transducer Corp., Boston
Instrument Flying Trainers	Curtiss-Wright Corp., Wood Ridge, N. J.
Power Plants	Fairchild Engine & Airplane Co., Farmingdale, L. I., N. Y.
Amplifiers	Rauland Borg Corp., Chicago
Transformers	Automatic Mfg. Corp., Newark, N. J. Triad Transformer Mfg. Co., Los Angeles Standard Coil Products Co. Inc., Los Angeles Westinghouse Electric Corp., Philadelphia Barker & Williamson Inc., Upper Darby, Pa. Capehart-Farnsworth Corp., Ft. Wayne, Ind.
Transformers and Coils	Eicar Inc., Chicago
Dynamotors	American Electric Welding Co., Baltimore
Harbor Tugs	Wiley Mfg. Co., Port Deposit, Md. Romer Boat Co., Holland, Mich. Avondale Marine Ways Inc., Westwego, La. Olson Corp., Beresford, Fla. Walker Mfg. Co., Racine, Wis. U. S. Thermo Control Co., Minneapolis Ed Friedrich Inc., San Antonio, Tex.
Hydraulic Jacks	
Refrigerating Units	

***** CHECKLIST ON CONTROLS *****

VERNMENT control orders are digested or
ed each week in this "Checklist on Con-
s." For complete copies of NPA orders,
te to U. S. Commerce Department, Division
Printing Services, attention E. E. Vivian,
m 6225, Commerce Bldg., Washington 25.
ESA orders, write J. L. Miller, Economic
bilization Agency, Room H367, Temporary
ldg., Washington.

Controlled Materials Plan

NSUMER DURABLES—Direction 1
NPA Order M-47A states that in
plying for allotments of steel, copper
d aluminum for the fourth quarter
1951, manufacturers of durable goods
est not call for more materials than
needed to make and assemble prod-
cts to fill rated orders during that
arter plus the quantity of materials
mitted for consumption in the third
arter under terms of M-47A. While
ese manufacturers are not under CMP,
ormation on their requirements is
eded so that effective distribution of
el, copper and aluminum can be de-
opped if it is decided to include con-
mer durables under CMP in the
urth quarter. Direction 1 was issued
y 20, 1951.

Price Regulations

EAD—The Office of Price Stabilization
ued a correction July 18 to Ceiling
e Regulation 53 (Lead Scrap Ma-
ials, Secondary Lead, and Antimonial

Lead). Corrected are inadvertent er-
rors.

COKE, CHEMICALS, GAS—Amend-
ment 3 to Supplementary Regulation 13
to the General Ceiling Price Regulation
corrects an omission of dates in Amend-
ment 2. Amendment 3 was issued
July 18, 1951. Supplementary Regula-
tion 13 deals with coke, coal chemicals
and coke oven gas.

TOOL STEELS—Supplementary Regu-
lation 42 to the General Ceiling Price
Regulation establishes higher ceiling
prices, with varying increases, for man-
ufacturers of high speed tool steels and
specialty steels containing tungsten, hard
facing products containing tungsten, and
pure tungsten and thoriated tungsten
products. Adjustments in ceiling made
by SR 42 will allow manufacturers to
recover most of the increase in tungsten-
bearing raw materials costs since the
GCPR base period. SR 42 is an in-
terim measure; OPS will shortly under-
take a study of the operations of manu-
facturers to determine the need for
changing the ceiling prices so established.
SR 42 was effective July 19, 1951.

TOOL STEELS—Amendment 17 to
Ceiling Price Regulation 22 excludes
from CPR 22 the products covered
(high speed tool steels and other metal
products containing tungsten) in Sup-
plementary Regulation 42 to the Gen-
eral Ceiling Price Regulation. Amend-
ment 17 was effective July 19, 1951.

TOOL STEELS—Amendment 5 to
Ceiling Price Regulation 30 excludes
from CPR 30 the products covered
(high speed tool steels and other metal
products containing tungsten) in Sup-
plementary Regulation 42 to the Gen-
eral Ceiling Price Regulation. Amend-
ment 5 was effective July 19, 1951.

CEILING PRICES—Amendment 1 of
Supplement 1 to Delegation of Au-
thority 6 permits directors of the di-
visions of the Office of Price Opera-
tions, Office of Price Stabilization, to
establish a ceiling price in accordance
with any ceiling price regulation which
provides for the establishment of a ceil-
ing price by the director of price stabili-
zation either where the ceiling price pro-
posed by the seller under the regulation
has been disapproved in whole or in
part, or where more information is re-
quired. Amendment 1 was effective
July 20, 1951.

CEILING PRICES—Amendment 1 of
General Overriding Regulation 13 of the
Office of Price Stabilization says that
manufacturers may start pricing under
the general manufacturers' order (CPR
22) and related manufacturing regula-
tions if they had complied with their
terms and announced new prices be-
fore July 1, even though the price
lists were not effective until after that
date. If manufacturers complied with
the various requirements of the regula-
tions and could have sold at new ceil-
ings on or before June 30, 1951, they
may now use these ceiling prices if
they made a public announcement of
the price changes before July 1, 1951.
Amendment 1 was issued July 23.

FTC Hits 17 Sewer Pipe Firms

Federal Trade Commission Trial
Examiner Frank Hier holds that 17
manufacturers of vitrified clay sewer
pipe have combined in unfair pricing
practices for the last five years.

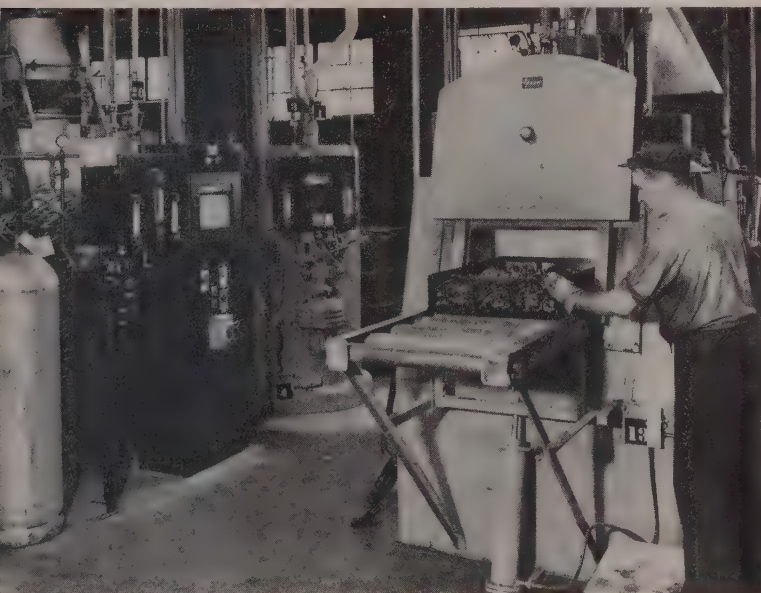
His decision ordering an end to the
joint action becomes effective in 30
days unless the companies appeal to
the FTC or the commission on its
own motion takes up the case for re-
view. The 17 firms operate about 25
of the 75 plants in the nation making
the pipe.

Radioisotopes for Foreigners

The Atomic Energy Commission for
the first time has made some U. S.-
produced radioisotopes available to
foreign users for industrial research
and applications.

The action increases the number of
U. S.-produced isotopes available to
buyers in foreign countries from 26
to 99. Among the more useful of the
newly available isotopes are cesium-
137, yttrium-91, selenium-75 and tan-
talam-182, which all have applica-
tions in industrial research; and
chromium-51, nickel-59 and 63 and
tungsten-185 which are useful in
metallurgical research.

The U. S. radioisotope export pro-
gram has been in effect since Sept.
3, 1947.



CYCLE FOR MOTORCYCLE: A tray load of motorcycle clutch gear nuts are
prepared for carbon nitriding in this new gas-fired Ipsen heat treating unit at
Harley-Davidson Motor Co., Milwaukee. Parts such as clutch plates, stand
brackets and steering heads are automatically handled through the entire
heating and cooling cycle. The atmosphere sealed furnace is capable of per-
forming normalizing, stress relieving, carburizing, gas cyaniding, brazing, hard-
ening, and straight heat treating

Windows of Washington

By E. C. KREUTZBERG Washington Editor

So much of the Commerce Department's time is being spent in getting information that it has little time to get out reports. That's why statistics on primary metals will be late

COMPLAINTS are mounting in the Commerce Department over delays in issuing monthly statistics on such primary products as ferrous and non-ferrous castings, commercial forgings, steel drums and barrels, steel boilers, etc. The reason: Reports are being released several months late. Statistics on gray iron, malleable and steel castings for example have just come out now for January-April and no promises are made for May.

Threefold Wrinkle—Why the delay? First, the Census Bureau and Bureau of Mines (they gather the information) made some changes in their forms this year to improve their statistics—and it took some time for reporting manufacturers to get used to them.

Second, manufacturers nowadays must file many reports to a host of government agencies that they don't have to bother with normally—and those extra reporting burdens slowed them down. Third, statistical information because of the defense program must be obtained and collated in a great deal more detail than in ordinary times.

Cases in Point—It had been the custom for the Census Bureau to base its castings statistics on returns from 600 foundries. But early this year NPA said that wouldn't do; for the purpose of fairly distributing available materials supplies it needed reports on every individual foundry. So the Census Bureau sent out forms to approximately 3600 foundries in the United States. Naturally, there was delay. Again, where ferrous scrap previously had been reported in one total, it became necessary for NPA purposes to break the total down into 21 different grades of scrap.

Well, the Commerce Department hopes to get back to a schedule of current reporting before the end of the year—but it's keeping its fingers crossed.

To Date on Titanium...

Copies of a "Symposium on Titanium" compiled by the Defense Department's Research & Development Board may be had free by writing to the Office of Technical Services,

Commerce Department, Washington 25. Order number is PB 103 564. The book reviews the titanium research projects of the armed services.

The Search Is On...

Now that a new laboratory-size rolling mill is installed, the Bureau of Mines' Experiment Station at Redding, Calif., is ready to proceed with a research investigation of vital importance to the steel industry. The purpose is to determine the minimum amounts of manganese that must be used with different sulphur contents to get satisfactory rolling of steel. In particular, answers will be sought on how much manganese is needed to produce high sulphur, free machining screw stock that will not crumble in the rolling operation. The investigation will start with pure iron to which controlled amounts of sulphur and manganese will be added. The new mill, built by United Engineer-



BIG OPERATION: The Army's Engineer Research & Development laboratories at Ft. Belvoir, Va., occupy 24 buildings where 1800 engineers work on such things as field testing of bulldozers, new equipment to put out intense fires and testing equipment for arctic cold and desert heat. Here, a Caterpillar tractor goes through a low-temperature test in a cold room

ing & Foundry Co., is designed to roll 2-inch square billets into 3/4-inch rounds.

Goings on Abroad...

Co-operative research work among Western European countries, under the stimulus of our Marshall Plan, includes a project of potential interest to the American iron and steel industry. It is a study to determine the cheapest methods for producing iron and steel from low-grade iron ore and coal, plentiful in Europe. To increase furnace efficiency so-called "enriched air" is to be used.

An experimental blast furnace for this purpose now is under construction near Liege in Belgium. Participating countries are the United Kingdom, Belgium, France, Netherlands, Italy and Western Germany. The project is under direction of the Organization for European Economic Co-operation, headquartered in Paris.

Penalty Provision Pigeonholed...

H. R. 2401, the Walter bill—passed by the House on Apr. 17—appears to be permanently pigeonholed in a subcommittee of the Senate Judiciary Committee. The measure stems from a belief that the existing maximum penalty of \$5000 for criminal violations of the Sherman antitrust law was not effective in encouraging compliance. Under the Walter bill the maximum penalty is \$50,000.

Shifts and Changes...

New changes in key personnel in NPA's Iron and Steel Division are: F. A. McClelland, Wheeling Steel Corp., replaces E. J. Sanne, Inland Steel Co., as chief, Tin Plate Section... James Hudson, Grammer, Dempsey & Hudson Co., Newark, N. J., replaces G. Russell Link, Central Steel & Wire Co., Detroit, as chief, Warhouse Section... C. T. Hapgood, Jones & Laughlin Steel Corp., replaces Jay W. Owings, Youngstown Sheet & Tube Co., as chief, Pipe & Tube Section... W. J. McCune, Sharon Steel Corp., replaces John S. Ewing, United States Steel Co., as chief, Stainless Steel Section.

William Webster resigned as chairman of the Defense Department Research & Development Board to return to his post with a New England electric power company. Walter Gordon Whitman, Massachusetts Institute of Technology, was nominated to succeed him.

Foreign Tool Exports Up

Thus far little of the increase has found its way into U. S. South America buys heavily

EUROPE's machine tool builders are expanding production.

Exports are increasing proportionately, but thus far little of that increase has found its way into the United States. South America is buying heavily, but the Europeans are not expected to crack the North American market unless deliveries offered by U. S. producers become drastically more extended than they now are. European prices are not enough lower than American to entice many U. S. buyers. Nor can the Europeans, except in isolated instances, surpass American quality.

Higher—The physical volume of Great Britain's machine tool output has increased 62 per cent since 1938, West Germany 16 per cent, Switzerland 68 per cent and Sweden 59 per cent. U. S. shipments were 75 per cent above the 1945-1947 average in May, 1951. They are more than 100 per cent above 1938 levels.

Major exporters of European machine tools are Britain, West Germany, France, Switzerland, Italy and Sweden. Most European builders deal abroad, including in the U. S., through agencies. Britain is the leading exporter, West Germany is second. The latter's machine tool deliveries abroad are about 66 per cent as much as the U. K. exports. West Germany's exports amount to about 26 per cent of its total machine tool production. Some 15.7 per cent of total German exports consist of machine tools.

Strong—Great Britain and Italy are strong in South American markets. Germany is, too, but her position is not what it was before World War II. Of all European tool exporters, Switzerland perhaps enjoys the best position in the U. S. That's because of the popularity of the Swiss jig borers.

One nation which has become an important machine tool exporter since the war is Sweden. Machine tool expansion during the past few decades has been more pronounced than that of any other industry in the country. "Its tools, on the whole," says National Machine Tool Builders' Association, Cleveland, "are comparable in type and performance to those made in the U. S." Quality is good, and the nation's producers make most of the ordinary types. Special models, which cannot be profitably made because of the limited domestic market, are imported.



SERVICING CATERPILLAR DIESEL TRACTORS

... a nightly task on a six-day, 136-mile trip through the bush

Delivering Tractors—Through the African Bush

DELIVERING a dozen Caterpillar tractors and Davis heavy-duty plows through the African bush country is no snap—as United Africa Co. (Technical) Ltd. found out. The company had to deliver the machines to the Sokoto rice project in northern Nigeria before the plowing season began, and a big hitch was that the nearest rail terminal was 136 miles away. UAC got the job done, but it took six days.

The tractors were "walked" across the country and crossed the Sokoto

river at a shallow point. They were driven by natives from the Sokoto rice project who had to be trained for two weeks before they started the journey. Floods, mud and curious natives didn't ease the strain on the drivers or the native guide. But the latter, a resourceful chap, told the villagers along the route that the tractors were for the Sultan of Sokoto himself. That helped.

And the Caterpillars wormed their way through the jungle in time for the plowing season.



UNLOADING CATERPILLARS AT PORT ELIZABETH, SOUTH AFRICA

... a big market for road making machinery

Carl McDow

Tool Builder Blasts GOR 15

Blackall says the regulation replacing CPR 30 is dangerous profit control

GOR 15 is based on a formula of inefficiency-plus.

That's how Frederick S. Blackall Jr., vice president of National Machine Tool Builders' Association and president and treasurer of Taft-Peirce Mfg. Co., Woonsocket, R. I., describes the general overriding regulation issued by Office of Price Stabilization, supposedly to permit machine tool makers to make liberal individual adjustments in ceiling prices. GOR 15 went into effect July 16 (STEEL, July 16, p. 45) and superseded CPR 30, to which tool builders had previously been subjected.

The Charge — Mr. Blackall says GOR 15 is a regulation of profit control, not price control. Under the regulation, a machine tool company computes its average rate of return on total assets from 1938 to 1948 inclusive and is then permitted to realize 80 per cent of that rate when applied to its total assets today. Working backward from the allowable percentage of profit, the manufacturer may fix his prices for 12 months ahead at levels which he estimates will yield the profit allowed. But if the profit turns out to more than 5 per cent in excess of the rate allowed, the excess must be refunded to customers.

In a letter to congressmen, Mr.

Blackall makes these complaints: The refund provision is equivalent, in effect, to a 100 per cent excess profits tax administered by OPS; the regulation puts a floor under the earnings of the inefficient and high-cost manufacturer; the regulation does not carry out the directive of the Office of Defense Mobilization to stimulate production or provide incentive; the regulation has sinister implications for it could well serve as a profit-taking pattern to be applied to other industries.

What Is Wanted? — The machine tool builders seek controls based upon prices quoted during the freeze period, plus such allowances for increased costs as OPS considers proper.

Mr. Blackall also points out that those needs were clearly pointed out to OPS in months of discussion of the subject between the industry's advisory committee and government officials.

Mr. Blackall says the machine tool builders recognize the need for price controls, but do not see the necessity of profit curbs.

Fathers of Invention Cash In on Ingenuity

NECESSITY may be the mother of invention, but ingenuity is probably the father. A few of the ingenious "fathers" who spend their time thinking up ways to save money, or make things easier for everyone or just make a better product more efficiently

Inland To Build Houses

Inland Steel Co. will build 100 homes for Inland workers at East Chicago, Ind.

Preliminary plans call for erection of three-bedroom, two-story duplex houses similar in construction to the 100 buildings now operated by Inland in its Sunnyside development between 140th street and Industrial highway on the eastern limits of East Chicago.

A Gunnison First: PHA Homes

Gunnison Homes Inc., U. S. Steel's prefabricated housing subsidiary, will be the first in the history of its industry to enter public housing when it starts making 91 prefabricated buildings for a project in New Albany, Ind. William E. Bergeron, director of the Chicago field office of the Public Housing Administration, made the announcement. He says the average room cost is \$1654 for the New Albany project.

John J. O'Brien, president of Gunnison, says his company will compete for additional PHA projects throughout the nation.

and quickly were rewarded by their organizations in the past few weeks:

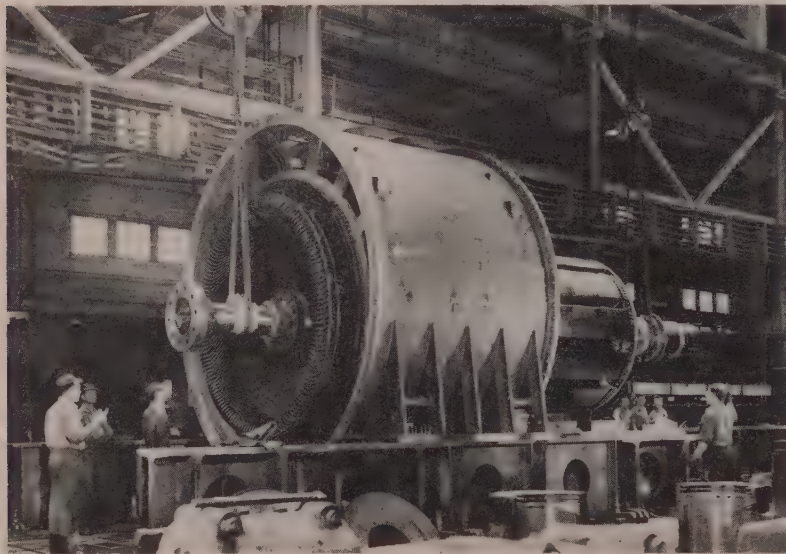
Feather in Cap, \$5000 in Hand

A man with a feather in his cap and \$5000 in his hand is Graham S. McCloy, 44-year-old engineer in Westinghouse Electric Corp.'s Appliance Division, Springfield, Mass. For Mr. McCloy is the inventor of a fully automatic defrosting refrigerator. He was handed a \$5000 check by Gwilym A. Price, Westinghouse president; the award is part of a Westinghouse program to reward outstanding employee inventors.

Previously, three East Pittsburgh, Pa., engineers were honored for an enameled wire development and one Sharon, Pa., engineer for a distribution transformer improvement.

Mechanized Stevedore Adopted

Never seen by its inventor—he is blind—an endless-chain conveyor for moving heavy freight in cargo airplanes was ordered for installation in a new Lockheed Aircraft Corp. Constellation-type military transport. The mechanized stevedore is the latest device invented by Henry P. Trusty since he was blinded by a head injury in World War I. Trusty is also the inventor of a corrugated box machine, the static chord used by paratroops for automatic chute opening,



S-T-E-A-D-Y: Clearance of less than $\frac{5}{8}$ of an inch between the rotor and the inside of the stator section of this 50,000-kilovolt-ampere hydrogen-cooled synchronous condenser makes the assembly operation as ticklish as threading a needle. The 90-ton rotor is guided gently into place by two overhead cranes at General Electric's large motor and generator divisions, Schenectady, N. Y.

the rumble seat, and a doughnut-making machine.

The conveyor is an outgrowth of Trusty's parachute-opening static chord.

Idea for Armco Pays \$2000

Armco Steel Corp.'s three-year old suggestion system at Middletown, O., is paying off—to the company and its employees. A check for \$2000 was recently paid out to an employee for a material-saving suggestion. The idea was to use a waste product to replace a more costly material that Armco had been buying for years. The plan's setup allows the person submitting an idea 10 per cent of the savings effected during the first year after adoption.

Westinghouse to the Rescue

Emergency repair facilities were set up in a 30,000-square-foot area of the Westinghouse jet engine plant in Kansas City, Mo., to speed up industrial rehabilitation of the flood stricken area.

Westinghouse workmen, engineers and equipment were made available on a 'round-the-clock basis for cleaning, drying and rebuilding electrical equipment damaged in the area's worst flood of the century. Aiding in the program are personnel of the Navy for whom Westinghouse operates the jet engine plant.

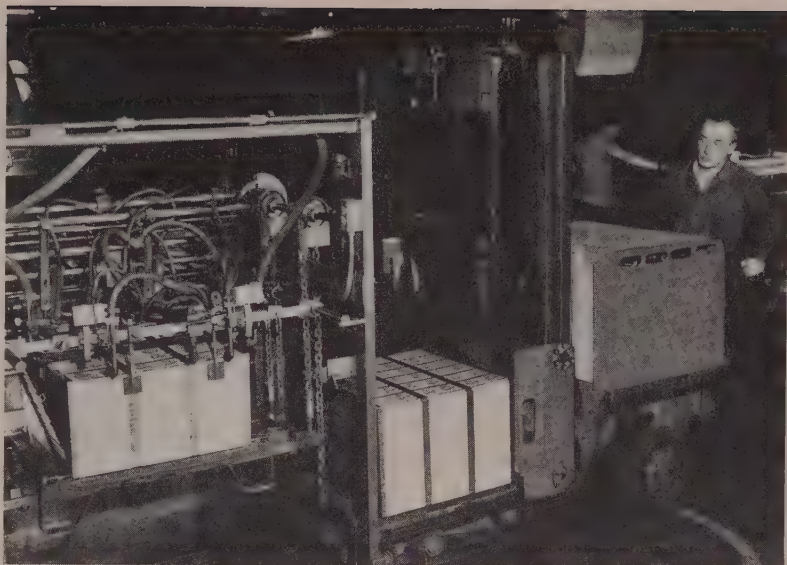
Besides providing on-the-spot emergency facilities, Westinghouse: Made arrangements to make available any piece of electrical equipment needed (they'll come from warehouse stocks); made plans at each of its manufacturing plants to take care of repairs that cannot be handled at Kansas City (personnel from St. Louis, Houston and Chicago will lend a hand); is working with local electric utilities to locate power apparatus that can be pressed into service.

Students Have Cake, Eat It Too

College students, picking up extra money during summer recess by working in steel mills, are "retiring" well before the opening of the fall term—and that income tax man is to blame.

If they earn over \$500 in the year, their fathers can not claim them as dependents. So, counting their earnings carefully, they find they can work up to the assessment limit and travel or loaf till the new term begins.

Weirton Steel Co. reports several hundred students hired as temporary summer workers have asked for work releases already.



"CURB" SERVICE: In Crown Can Co.'s Philadelphia plant a "table"-type lift truck places a skid load of tin plate sheets into proper position for feeding through a lithographing press. The load of 3500 pounds of partially processed tin plate will later be formed into tin cans. Handling of material by any means but mechanical has been practically done away with at the Crown plant

Fan Sales: Not So Hot

Those cool nights in June and early July mean listless activity

THOSE cool nights in June and early July were welcomed by all but the fan distributors. This seasonal industry, which must capitalize on the discomfort of the public, is sweating for the second straight year to spur listless sales.

Retailers of home and office ventilating fans are moving their product at only about a 10 per cent advance over 1950's exceptionally slow pace—but even this record is not reflected at the distributors' level. The latter mention drops ranging from 10 to 35 per cent from last year and cite "miserable fan weather" in 1950 to explain a big carry-over by retailers.

Scorcher—A scorching spring and summer in 1949 cleaned out retailers' salesrooms and caused them to buy last year for at least a comparable demand. When that failed to materialize, they stored the leftovers for another summer—thus shutting distributors out of their normal pre-season sales.

One Cleveland distributor reported no pre-season sales whatever to two of its largest outlets. The reason: Both were sitting on late summer stock from 1950 and were reluctant to supplement an inventory already considered adequate. The warmish

late July has finally caused buyers to fill in with new orders to help bring the distributor's sales up to a more respectable level.

A retailer termed sales "pokey" compared with the scorching 1949 record. He believes it will take two or three hot, humid nights when father is at home suffering to get sales rolling this summer.

Alcoa Stints Aluminum Facade

At the request of Defense Production Administrator Manly Fleischmann, Aluminum Co. of America will leave the lower six floors of its new 30-story home office building unfinished. Instead of aluminum panels the floors will be faced with temporary materials and be finished at a later date.

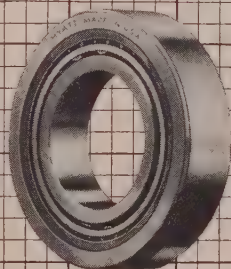
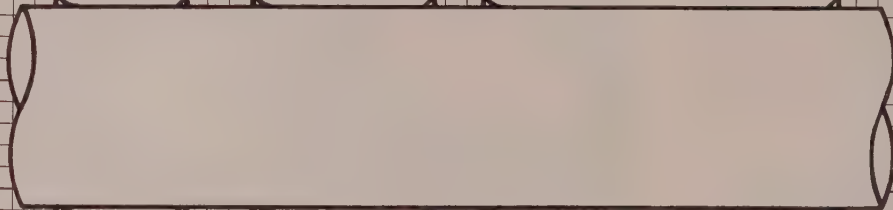
All aluminum for the project was set aside months ago; no aluminum is being taken from current production for the Alcoa building.

Completion of the building next year will permit Alcoa to concentrate all of its general offices in one structure.

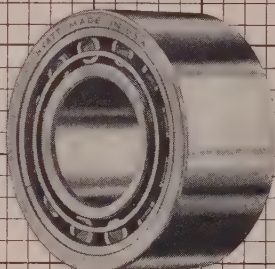
Mellon Plans Open House

Mellon Institute of Industrial Research, Pittsburgh, will hold open house Sept. 15-16 for the first time since 1937 when it was dedicated. Visitors will see results of the institute's research and observe its scientific facilities through demonstrations and exhibits in two-hour conducted tours of the building.

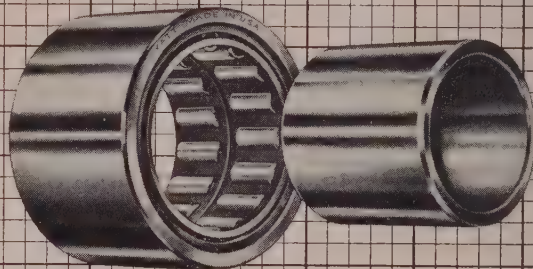
For Greater Bearing Capacity— HYATT HY-LOADS



A-1200-TS
Narrow Series



A-5200-TS
Wide Series



A-6200-TS
Duplex Series

Where bearing overall dimensions must be kept to a minimum, Hyatt Hy-Load Light Series Roller Bearings are available in three widths to satisfy load requirements and permit wide design range.

As greater load-carrying capacity or longer bearing life is required for a given shaft size and bore diameter, you can go progressively from the narrow, to the wide, or to the duplex series of Hyatt Hy-Load Bearings as illustrated.

When operating speeds are relatively low, greater radial capacity can be ob-

tained in limited space with Hyatt Hy-Loads of the full complement type. In this type of bearing, available in both wide and narrow widths, the roller separators are eliminated, and the maximum number of rollers are employed to provide increased capacity within the same boundary dimensions.

Write for a copy of catalog 547 . . . a complete guide to the selection and use of radial roller bearings. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

The UAW is having trouble with discipline and has transferred control of DeSoto Local 227 from its officers to a board member to stop walkouts

DETROIT

AN OLD hand in labor relations work in Detroit, last week said: "The UAW has lost its sense of timing. Now is the worst possible time, from their standpoint, for walkouts."

He was assuming that many of the interruptions at automotive plants are being union-inspired and have the sanction of UAW leaders. But a close look at two recent top-level union actions, shows the UAW official attitude strongly opposed to the rash of disturbances.

Drastic Action — The executive board of the international union on Monday took an unusual step by transferring control of DeSoto Local 227 from its officers to a board member whom it named as administrator of the Local's affairs. As explained by Norman Matthews, Director of UAW's Chrysler Department, "The international union was compelled to act to safeguard the interest of a vast majority of the DeSoto workers whose jobs were constantly threatened by irresponsible action of a small minority."

Since January, the DeSoto Warren Road Plant in Detroit has had about 70 shut-downs. The Wyoming Avenue Plant has had an additional ten. The work stoppages, Mr. Matthews said, have been caused by a "handful of people in key departments." Some shop stewards are in the group. The Local's officers are not held to blame for the walkouts and the new administrator is not planning to depose any of them. But his appointment gives him power to fire stewards and suspend union members without the customary hearing in the next 60 days.

Illegal—Most of the disturbances have been caused by alleged "speed-ups," and Mr. Matthews advised that union policy "is to authorize strike action against unwarranted increases in production standards wherever such action is shown to be justified and the membership votes approval . . . But the work stoppages at DeSoto have not been taken in compliance with the union constitution."

Hassle at Hudson

The Hudson ruckus is a somewhat less obvious example of the union's

Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,878
February	658,918	505,593
March	802,737	610,680
April	680,216	585,705
May	696,039	732,161
June	652,788*	897,853
July		746,801
August		842,335
September		760,847
October		796,010
November		833,874
December		671,622

Week Ended	1951	1950
June 30	156,105	197,767
July 7	98,087	137,731
July 14	117,747	194,073
July 21	128,017	187,339
July 28	132,000*	191,978

Sources: Automobile Manufacturers Association, Ward's Automotive Reports. *Preliminary.

desire to avoid its customary method of forcing an issue. A vote was taken on June 25, with 4111 members of Local 154 favoring strike action and 1256 against it. UAW brass felt that then was no time to "hit the bricks" and are soft-pedaling any mention of a possible strike. Hudson, they figure, is immune to that kind of a club and would come out of a strike a lot better off than the strikers.

Different Tack at Hudson — It is using, instead, a public opinion approach to force settlement of the dispute. Full-page ads in local newspapers contained a letter to Senator Blair Moody under the heading, "The Truth About Layoffs at Hudson Motor Car Co." In that letter the union charged the company "with wilfully and deliberately violating the contract between the union and the company and violating agreements reached on production standards in order to tie up their production and thus have a convenient excuse not to operate their plants because they are unable to sell their products." Hudson is also accused of provoking production bottlenecks which they use as an excuse to send workers home in order to avoid payment of unemploy-

ment compensation to their employees."

The letter cites periodic reductions in production schedules since March, pointing out that prior to the May 22-June 11 shutdown output was brought down to 40 assemblies an hour. When the workers returned, the letter states, "they found that the company had arbitrarily reduced the negotiated manpower on over 40 jobs by some 111 men." This reduction in manpower was made without consultation with the union and in direct violation of agreements with the union, it charges. The smaller workforce has been unable to meet production schedules, it says. The result is that the company closes its plants every day as soon as uncompleted assemblies start coming off the line. Last Monday marked the 30th working day in which the pattern repeated.

The company as yet has had no official answer to the union's charges, and both sides of the dispute seem determined to bull it through until one yells "uncle." The union suggests that the company close its plants and allow present employees to get jobs elsewhere or draw unemployment compensation.

Troubles at Canton

The UAW is in an uncomfortable spot with respect to union-shop contracts. Center of the dispute, this time between the union and the National Labor Relations Board, is the Canton, O., Forge Division of Ford Motor Co., where the International Brotherhood of Blacksmiths, Drop Forgers and Helpers, AFL, is seeking an election to establish their right to represent the 1418 hourly-rated workers.

NLRB decided on July 11 that the blacksmiths could petition for an election since national CIO officers were not in compliance with the requirements for filing anti-communist affidavits under Taft-Hartley Law provisions when union security elections by affiliated unions were conducted. The fact that individual CIO union officials including UAW leaders had complied was beside the point.

"This decision," said Walter Reuther, president of the autoworkers, "is a threat to stable labor relations throughout American industry . . ." and "if allowed to stand would disrupt thousands of established bar-

gaining relationships and encourage industrial unrest." CIO and Ford attorneys last week sought to win a reversal from NLRB, arguing that the contract had been made in good faith and should be allowed to stand for the four years it has to run.

Le Sabre Takes to the Road

The experimental General Motors car "Le Sabre," described in STEEL, Jan. 8, p. 39, when it was still being engineered, has now taken the road and will go on public display for the first time at the Michigan State Fair Aug. 31-Sept. 9. The product of almost five years' work by the styling section and by the Buick Division, this car undoubtedly sets a new record for custom-car cost and innovations.

Though appropriately designed as "a laboratory on wheels," it even more is a rolling testimonial to the increased stature of stylists in the automobile industry. It is the brainchild of one of the first and foremost of these—Harley J. Earl, GM vice president in charge of styling.

Small Beginnings—Back in 1927, after having designed the original LaSalle and redesigned Cadillacs, Mr. Earl was put in charge of the newly formed General Motors Art & Color Section.

Given little more than office and a drawing board and a plethora of uncomplimentary remarks by the engineers who thought that black was a good enough color for cars and that stylists belonged in the women's

fashion industry, Mr. Earl went to work to change all this. Ten years later the styling section replaced Art & Color.

In GM now, styling plays as integral a role in motorcar building as engineering and research. The section employs 450 people whose talents include sculpturing in wood, plaster and metal, paint and trim selection and design. The section contains individual studios for each GM car division, and the truck and coach division. Also handled are other GM products, including diesel locomotives and household appliances. From it also come elaborate exhibits for special purposes.

New Departure—There are in the body construction of "Le Sabre" some significant departures from conventional procedure and material. All important members, for example, are cast magnesium and sheet aluminum. Magnesium castings are used for the deck lid, cowl, front fender valance, lock pillars and door inner panels. Aluminum sheeting is used for the hood, fenders, and door outer panels. The engine, likewise, makes extensive use of light metals, with the head and cylinder block being of cast aluminum alloy. The cylinder walls are lined with heat resistant iron castings and the valve seats are stainless steel inserts.

Obviously, General Motors has no immediate intention of transplanting these costly materials to production-run cars. Its faith in the long-term future of steel for automobile construction has been visibly displayed

in the loans it has made to steelmakers to help finance their expansions. Nevertheless, there is the opinion among some Detroit automaten that, when the defense requirements which are bringing about increases in aluminum and magnesium facilities subside, those metals will gain wider use in automotive applications. General Motors, they reason, will have an opportunity to explore some of those with "Le Sabre."

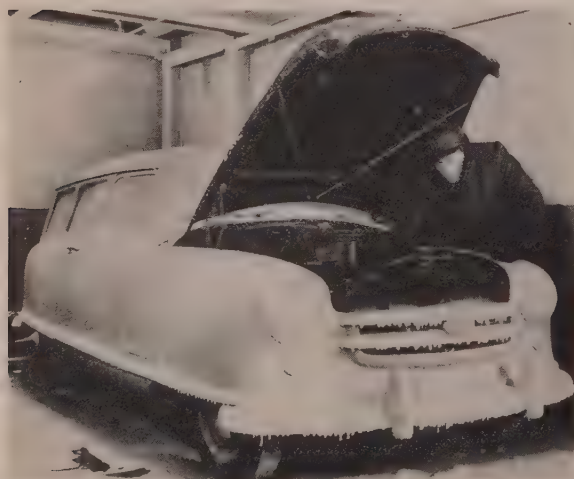
Chevrolet Expands in Buffalo

Chevrolet will erect three buildings at Tonawanda, N. Y., between its Tonawanda Manufacturing Division plant on River road and the government-owned Chevrolet Aviation Engine Division (nee Aviation Plant No. 1) on Kenmore avenue.

Adding almost one million sq ft of floor space to its operations, the company will use the new facilities in production of Wright R-3350 power plants for the Air Force and Navy.

Torture Chamber for Fords

Figuring out new ways to torture their vehicles in the laboratories is an ever-present job of automotive engineers. One of the fanciest devices for this purpose has been developed by Ford's quality control gage and test section. This "rough road" tester, measuring 30 feet in length, produces bumps and twists of greater magnitude than probably would be encountered on many roads.



GOOD OLD SUMMER TIME: Although the weather's hot outside, Nash Motor's cold room at Kenosha, Wis., is 20 degrees below zero. Summer's the time for the auto plant to test for the coming winter's freeze. Engineers, who must wear arctic garb, test oil reaction, starting and overall engine operation under the freezing conditions to improve winter performance. Temperatures of 40 degrees below zero can be registered in the "cold room"



ROUGH ROAD TO TRAVEL: Looking and listening for hidden noises while a car simulates road conditions, this quality control inspector uses Ford Motor Co.'s new "rough road" testing unit. It is set in motion by 5-horsepower electric motors operating rollers under the wheels. The car's wheels turn with other rollers which have 2-inch humps that cause the car to react as it would on rough roads. Design is by Ford's quality control department

The Business Trend

Industrial production index slips below year-ago levels for the first time since March, 1950, but it's not alarming, as the last half of last year was a record-breaker

THIS MONTH marks the first time since March, 1950, that STEEL's industrial production index has not exceeded the level of the corresponding period of a year ago.

The week ended July 21 was the second consecutive one in which the index remained beneath the shadow of last year's performance. Preliminary index for the week ended July 21 was 211 per cent of the 1936-1939 average. In the corresponding week of last year the index was 214.

The first week of failure in this July to measure up to last year's level was that which ended July 14. For that week STEEL's index was 206 per cent, compared with 209 in the like week of 1950.

Why the drop? It's largely the result of government restrictions on automobile production, but to some degree of lower number of loadings of railroad freight cars. The other two factors in STEEL's index—steel production and electricity output—are running ahead of the level for this time last year.

Another reason for the narrowing of the gap between industrial production now and for the corresponding period of a year ago is that industrial activity began climbing in June, 1950, with the outbreak of the Korean war and continued at phenomenal levels during the last half of the year. Considering government restrictions on civilian production and the bite that taxes and inflation are taking out of the civilian consumers' dollars, it is not likely that industrial production from here on will exceed its year-ago counterparts with the margin that has been characteristic of the last 15 months.

The Guns Are Coming ...

Much of the decline in production of automobiles and civilian goods will be offset by increased outturn of armament. Not only is the tempo of armament production rising in plants converting to defense equipment but many new plants are being built to produce defense materiel, and addi-

tional expansion goals for specific industries are being set.

More Billions for Defense ...

Korean peace talks or no Korean peace talks, the United States defense program will continue to be a potent factor in our economy. President Truman in his midyear economic report to Congress said our total security program expenditures, which now are at an annual rate of more than \$35 billion, are scheduled to increase to an annual rate of more than \$50 billion by the end of this year and to nearly \$65 billion by the middle of 1952. This, he said, means that the proportion of the nation's total output devoted to security purposes will rise from the present 11 per cent to approximately 15 per cent by the end of 1951 and will approach 20 per cent by a year from now. Before Korea, it was 6 per cent.

Second Gear for Autos ...

To share its metal supplies with the growing defense program, the automobile industry has had to shift down into second gear. Instead of turning out 180,000 to 190,000 pas-

BAROMETERS of BUSINESS

INDUSTRY

Steel Ingot Output (per cent of capacity)†	102.0	101.5	103.0	98.0
Electric Power Distributed (million kilowatt hours)	6,975	6,739	6,835	6,186
Bituminous Coal Production (daily av.—1000 tons)	1,408	235	1,717	1,512
Petroleum Production (daily av.—1000 bbl)	6,180	6,171	6,192	5,538
Construction Volume (ENR—Unit \$1,000,000)	\$361.1	\$361.0	\$207.4	\$343.3
Automobile and Truck Output (Ward's—number units)	128,017	117,747	158,909	187,339

*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.

TRADE

Freight Car Loadings (unit—1000 cars)	800†	779	833	830
Business Failures (Dun & Bradstreet, number)	133	173	180	170
Currency in Circulation (in millions of dollars)‡	\$27,781	\$27,893	\$27,479	\$27,029
Department Store Sales (changes from like wk. a yr. ago)‡	—10%	0%	+1%	+25%

‡Preliminary. †Federal Reserve Board.

FINANCE

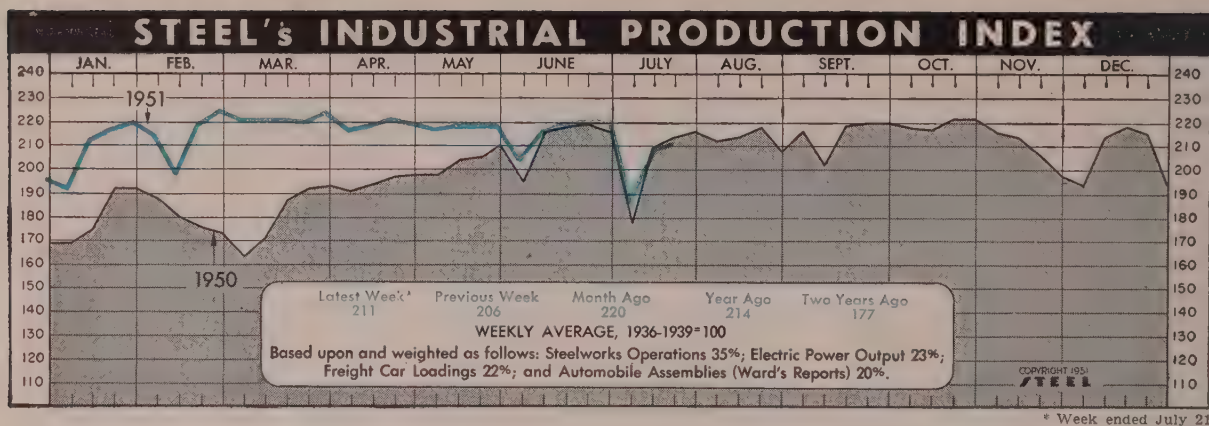
Bank Clearings (Dun & Bradstreet—millions)	\$15,525	\$16,065	\$17,830	\$15,096
Federal Gross Debt (billions)	\$255.0	\$254.7	\$254.4	\$257.2
Bond Volume, NYSE (millions)	\$13.7	\$12.3	\$11.8	\$28.9
Stocks Sales, NYSE (thousands of shares)	6,349	5,441	5,711	11,744
Loans and Investments (billions)†	\$70.1	\$70.3	\$69.5	\$67.6
United States Gov't. Obligations Held (millions)†	\$30,697	\$30,886	\$30,555	\$36,248

†Member banks, Federal Reserve System.

PRICES

STEEL'S Weighted Finished Steel Price Index††	171.92	171.92	171.92	156.69
STEEL'S Nonferrous Metal Price Index‡	226.0	226.0	226.0	192.1
All Commodities‡	178.8	179.7	181.6	164.3
Metals and Metal Products‡	188.2	188.2	188.2	172.6

‡Bureau of Labor Statistics Index, 1926=100. †1936-1939=100. ††1935-1939=100.



senger cars and trucks a week as it did this time last year, the auto industry in the United States and Canada produced 128,017 units in the week ended July 21, says *Ward's Automotive Reports*. Nevertheless, this was an upturn over the preceding week's 117,747. Materials availability continues to be the principal governor over production, although other depressants are labor troubles, summer vacations and the flood in the Midwest.

Steel Pours On ...

Spurred by heavy needs of both civilian and defense production, the

steel industry continues to operate at above rated capacity. It has been doing this since last March.

Output of steel for ingots and castings in the week ended July 28 was scheduled to be 2,027,000 net tons, a decline of 10,000 tons from the preceding week's outturn. A year ago, production was 1,892,000 tons.

Even though the steel industry in operating above its rated capacity, the metalworking industry is not getting all the steel it could use.

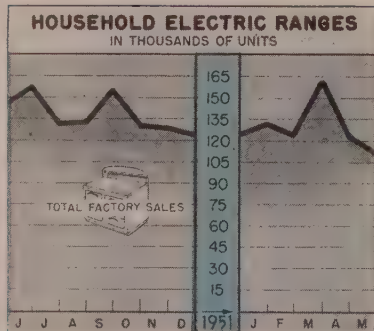
Squeeze-Play on Sweepers ...

The squeeze being inflicted on civilian production by the defense

program is clearly demonstrated in the industry producing household vacuum cleaners.

With one exception, June was the first month in five years to see an output of less than 200,000 units. Factory sales in June totaled 194,548 units, reports the Vacuum Cleaner Manufacturers' Association. The other month in which sales fell below the 200,000-mark was July, 1949, when they dipped to 161,920 units.

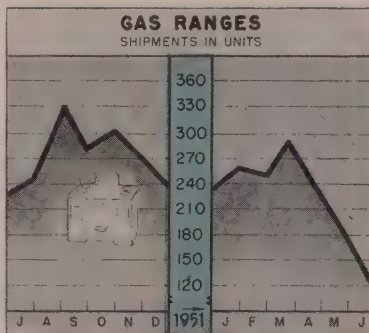
The June factory sales figure of 194,548 was a decrease from the preceding month for the third consecutive time and represented a 3.7 per cent decline from 201,983 units in May. June also was the fifth con-



Household Electric Ranges
Total Factory Sales—Units

	1951	1950	1949
Jan.	132,437	97,925	109,919
Feb.	123,953	118,989	88,333
Mar.	162,267	145,417	88,934
Apr.	122,803	132,859	60,739
May	109,572	145,498	52,881
June ....	.....	158,534	69,107
July ....	.....	130,505	63,249
Aug. ....	.....	132,243	66,753
Sept. ....	.....	156,216	93,045
Oct. ....	.....	130,452	73,312
Nov. ....	.....	129,384	60,523
Dec. ....	.....	124,360	77,011
Total	1,602,382	903,806	

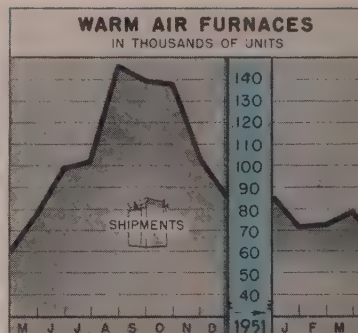
National Electrical Mfrs. Assoc.



Gas Ranges
Shipments in Units

	1951	1950	1949
Jan.	260,600	165,000	106,700
Feb.	254,000	209,000	117,700
Mar.	289,800	264,000	151,500
Apr.	225,000	239,100	150,100
May	172,700	242,800	151,600
June	113,300	217,000	162,200
July ....	.....	254,800	125,800
Aug. ....	.....	331,500	206,100
Sept. ....	.....	287,000	227,300
Oct. ....	.....	308,000	257,500
Nov. ....	.....	269,100	237,400
Dec. ....	.....	235,900	175,700
Total ...	3,023,200	2,069,600	

Gas Appliance Mfrs. Assoc.



Warm Air Furnaces
Shipments in Units

	1951	1950	1949
Jan.	71,143	39,887	31,734
Feb.	71,966	45,618	33,011
Mar.	79,239	59,982	41,271
Apr.	60,337	58,798	34,471
May ....	.....	78,349	42,406
June ....	.....	98,517	55,916
July ....	.....	102,159	48,575
Aug. ....	.....	145,512	85,320
Sept. ....	.....	139,014	112,264
Oct. ....	.....	137,915	103,401
Nov. ....	.....	102,001	79,280
Dec. ....	.....	85,407	52,323
Total	1,093,189	719,972	

U. S. Bureau of the Census

Charts—Copyright 1951, STEEL

secutive month to show a decrease from the comparison period of 1950.

Furnace Business Cools Down . . .

Another industry reflecting the pinch from the defense program is that which produces gas-fired furnaces. Not all of the decline in furnace production can be attributed to the difficulty of procuring metals; part of it undoubtedly stems from restrictions on use of gas for heating.

In each of the months of the second quarter of this year, production of gas furnaces fell substantially below the corresponding months of last year, thus making the total output for the first half of this year 192,800 units, compared with 228,600 in the first half of 1950, reports the Gas Appliance Manufacturers Association.

Changing Jobs . . .

As the consumer goods industries continued to be pinched down, employment in them dropped off. But losses in them were offset by gains

in defense-related industries, construction and food processing.

Overall, employment in nonfarm establishments rose between mid-May and mid-June to 46.4 million, compared with 46.2 million a month earlier.

Trends Fore and Aft . . .

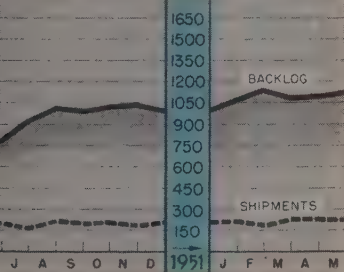
Heavy industrial building contract awards resumed their rapid pace and topped other classes of construction in the week ended July 19 . . . Class 1 railroads put 1309 new locomotives into service in the first half of 1951, compared with 1127 in the like period of 1950 . . . Cash dividend payments of United States corporations issuing public reports totaled \$2500 million in the first five months of 1951, about 11 per cent higher than the \$2264 million paid out in the corresponding period of last year . . . The week ended July 17 was the seventh consecutive one in which there was a decline in the wholesale price index of the U. S. Bureau of Labor Statistics. Latest index was 178.8 per cent of the 1926 average.

Issue Dates of other FACTS and FIGURES Published by STEEL:

Durable Goods July2	Indus. Production July23	Refrigerators June18
Employ., Metalwkg. July16	Ironers July16	Steel Castings July9
Employ., Steel July23	Machine Tools July2	Steel Forgings July2
Foundry Equip. July16	Malleable Castings July9	Steel Shipments July2
Freight Cars July23	Prices July23	Vacuum Cleaners June4
Furnaces, Indus. July2	Pumps, New Orders July9	Wages, Metalwkg. June18
Gear Sales July9	Purchasing Power July23	Washers July16
Gray Iron Castings July9	Radio, TV July16	Water Heaters June25

FABRICATED STRUCTURAL STEEL

IN THOUSANDS OF TONS



Fabricated Structural Steel

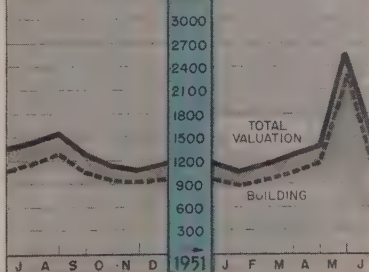
Thousands of Net Tons

	Shipments	Backlog
	1951	1950
Jan.	214.0	154.7
Feb.	193.6	149.8
Mar.	237.1	185.2
Apr.	234.7	187.8
May	233.1	194.8
June	202.4	781
July	165.5	920
Aug.	198.7	1,009
Sept.	198.7	993
Oct.	211.8	1,018
Nov.	193.8	1,034
Dec.	212.9	1,007
Total	2,275.9	11,922.5

American Institute of Steel Construction

CONSTRUCTION VALUATION

IN MILLIONS OF DOLLARS



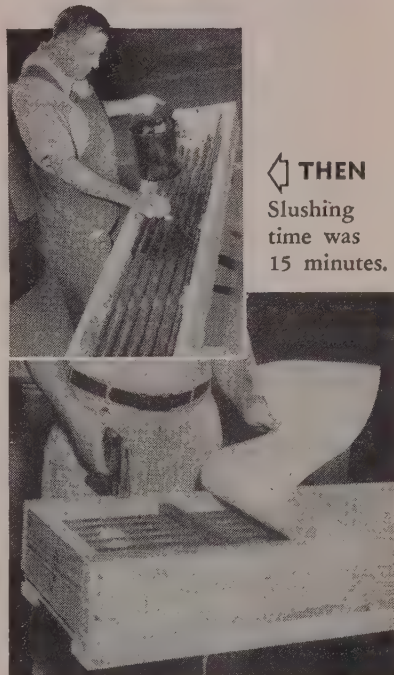
Construction Valuation

(37 States)—In Millions of Dollars

	Total	Building
	1951	1950
Jan.	1,043.2	730.9
Feb.	1,140.5	779.5
Mar.	1,267.4	1,300.2
Apr.	1,375.0	1,350.5
May	2,573.0	1,347.6
June	1,408.9	1,345.5
July	1,420.0	1,108.9
Aug.	1,548.9	1,295.1
Sept.	1,286.5	1,048.3
Oct.	1,135.8	956.7
Nov.	1,087.1	931.6
Dec.	1,169.4	969.0
Total	14,501.1	11,922.5

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Photos courtesy Whitin Machine Works

NOW only 6 minutes are required to line box with Angier VPI* Wrap. This revolutionary coated paper gives off vapor that stops rust. It eliminates slushing. "Degreasing" time saved per box — one hour. Total time saved per month — 460 hours. To simplify packaging of *your* metal products, send coupon today!

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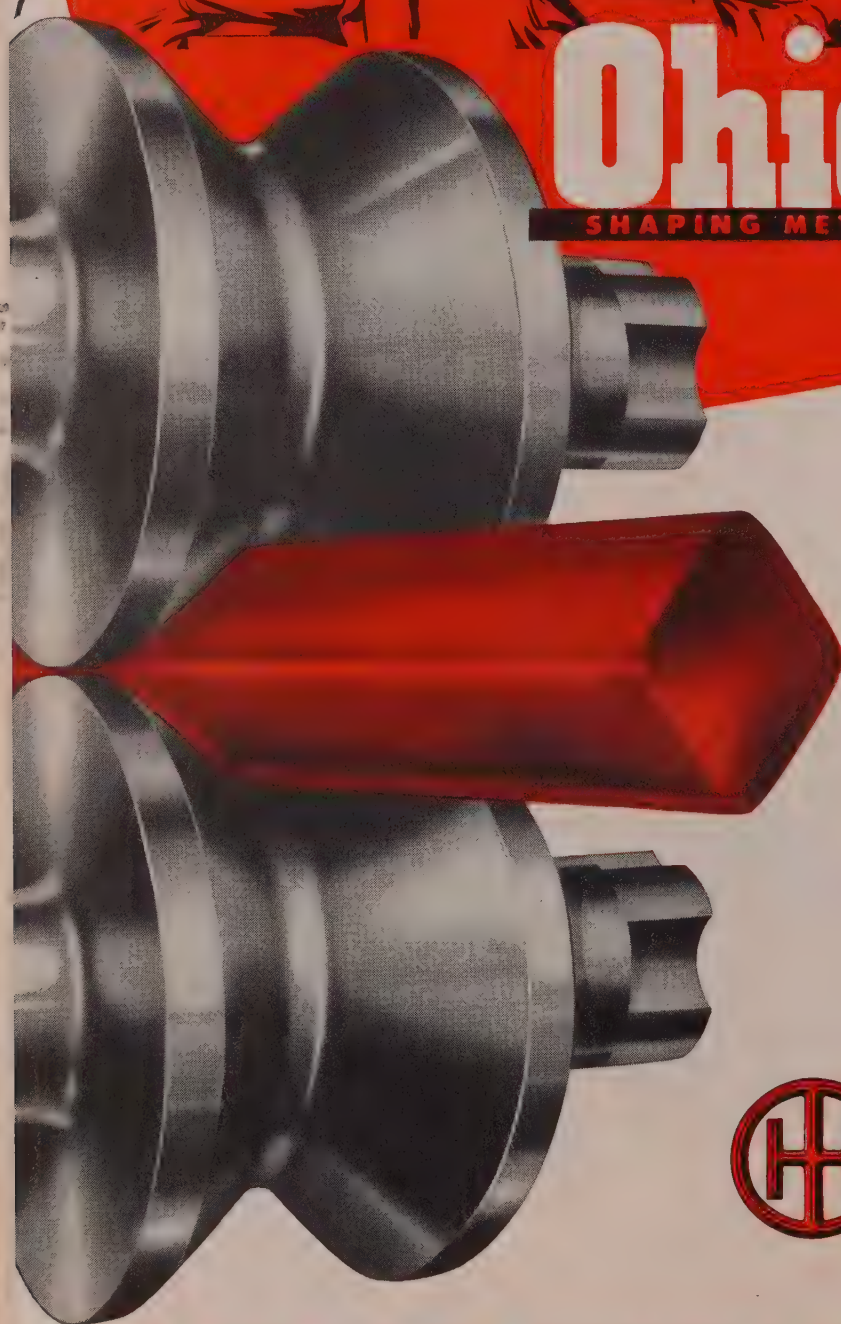
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|---|---|
| <input type="checkbox"/> Machinery - Industrial, Metal Working, Farm, Office, Construction. | <input type="checkbox"/> Steel in process of fabrication. |
| <input type="checkbox"/> Electrical Machinery, Appliances, Products. | <input type="checkbox"/> Instruments and clocks. |
| <input type="checkbox"/> Fabricated Products—Cutlery, Hardware, etc. | <input type="checkbox"/> Ordnance Equipment. |
| <input type="checkbox"/> Transportation Equipment—Aircraft, Auto, Naval, Railroad, etc. | <input type="checkbox"/> Others: |

(USE MARGIN for name, title, firm, address)



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At Ohio Steel our system of
INTEGRATED PROCESS CONTROL
 contacts every phase of
 manufacturing and testing. Engineers
 follow and chart performance
 records of every roll that leaves
 our plant. This data is collected
 into a roll history and preserved
 in Ohio Steel files along with
 manufacturing and testing records
 of the roll. Roll histories,
 production information, research
 findings and anything learned
 from rolls bought as scrap
 provide **PROCESS CONTROL** v
 material for improving
 manufacture of Ohio R



THE OHIO STEEL FOUNDRY CO. LIMA, OHIO

PLANTS AT LIMA AND SPRINGFIELD, OHIO

Men of Industry



ALFRED G. DENNISON

... heads sales at Riverside Metal

Alfred G. Dennison was promoted from assistant sales manager to general sales manager of **Riverside Metal Co.**, Riverside, N. J., replacing **Fred M. Shelley Jr.** who will return to his former post as district manager of Newark, N. J., territory.

Kaiser Steel Corp., Oakland, Calif., appointed **Brooks Kitchel** purchasing agent, Fontana, Calif., plant, to replace **R. N. Sturtridge**, resigned. **E. W. Holbrook** succeeds Mr. Kitchel as superintendent of stores.

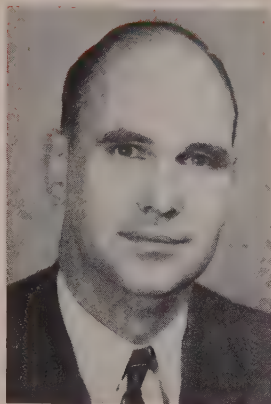
Donald N. Cleary was promoted to production manager, and **John S. Randall**, formerly with Superior Separator Co., was made plant manager of **Frank G. Hough Co.**, Libertyville, Ill.

Frank J. Byrne was appointed assistant manager of sales for the steel strapping division of **Brainard Steel Co.**, Warren, O. He formerly was a company sales representative in the Cleveland district. He joined Brainard, Sharon Steel subsidiary, late last year.

Robert E. Breit was appointed traffic supervisor of the Milwaukee works of **International Harvester Co.**

Buda Co., Harvey, Ill., elected **L. F. Shoemaker** as a vice president. He started with the company in 1920 and recently has been sales manager.

Marquardt Aircraft Co., Los Angeles, appointed **John M. Rogers** assistant to President **Roy E. Marquardt**. He was formerly vice president and director of military sales, Douglas Aircraft Co., Santa Monica, Calif.



VERNON E. HENSE

... chief metallurgist at Buick

Vernon E. Hense was appointed chief metallurgist at **Buick Motor Division** of General Motors Corp., Flint, Mich., succeeding **Robert B. Schenck** who retired. Mr. Hense was formerly assistant chief metallurgist.

Ellen G. Ingalls has been named president and chairman of the board, **Ingalls Iron Works Co.**, Birmingham; board chairman of **Ingalls Ship Building Corp.**, Pascagoula, Miss.; and president of **Steel Construction Co.**, Birmingham. She succeeds her husband, the late **R. I. Ingalls**. **M. F. Pixton**, vice president and treasurer, was designated chief executive officer.

Leo Martin joined **Flexible Tubing Corp.**, Branford, Conn., as machine design engineer and **James W. Hull** as chief of the chemical laboratory.

William K. McGreevy was appointed sales representative of the Pittsburgh regional office of the Philadelphia division, **Yale & Towne Mfg. Co.**

William A. Mallory was named manager of mechanical connectors department for **National Electric Products Corp.**, Pittsburgh. He also will assist in managing the company's busway department.

Wallace M. Loos, formerly manager of stainless steel sales, **Carpenter Steel Co.**, at its plant in Reading, Pa., was promoted to manager of mill products. He is succeeded by **Harold A. Brossman**, who in turn is succeeded as manager of alloy steel sales by **Howard M. Goodman**. **Robert F. Koch** was promoted to assistant manager of stainless steel sales.



A. H. BORCHARDT

... a V. P. of Worthington Pump

A. H. Borchardt was elected a vice president of **Worthington Pump & Machinery Corp.**, Harrison, N. J. Associated with the company many years, his most recent position was assistant vice president and manager of centrifugal pump application and sales division.

Roy W. Johnson was appointed executive vice president of **Republic Supply Co. of California**, Los Angeles. He was formerly general sales manager and will be succeeded in this position by **W. Dale Russell**, senior vice president.

Walter B. Siegel was appointed general personnel and industrial relations manager for the **Soule Steel Co.**, San Francisco. Mr. Siegel, who was formerly with the Owens-Illinois Glass Co., will make his headquarters in San Francisco and will be active also at Soule's Los Angeles and Portland, Oreg., plants.

Harold A. Miller was appointed general staff manager, general sales department, **United States Steel Supply Co.**, Chicago, warehousing subsidiary of U. S. Steel Corp. He succeeds **W. C. Etheredge**, who joined the price division, commercial department of U. S. Steel at Pittsburgh.

Weber Aircraft Corp., Los Angeles, subsidiary of **Weber Showcase & Fixture Co. Inc.**, elected **Charles B. Buckley**, formerly general manager of Weber's aircraft division, and **Arnold Johnson**, formerly works manager at Weber Showcase, vice presidents.

Robert B. Mounsey, formerly of magnesium technical service and development, **Dow Chemical Co.**, Midland, Mich., was named magnesium sales

representative in Dow's Cleveland office.

William E. Saupe was appointed operation manager and **Will Pruessman** was named manager of manufacturing of the Schenectady steam turbine and generator divisions of **General Electric Co.**, Schenectady, N. Y.

James W. Kent, formerly supervisor of material control at the Fontana plant of **Kaiser Steel Corp.**, was appointed buyer, scrap procurement, at the Los Angeles district sales office. **Curtis Bonneville** was appointed general foreman of the merchant-skelp mill at the Fontana, Calif., plant.

J. C. Hammel was appointed manager of accounting, a newly created position of **Oglebay, Norton & Co.**, Cleveland.

Louis G. Hehman was elected vice president of **Luria Steel & Trading Corp.**, New York.

New officials at **Acro Welder Mfg. Co.**, Milwaukee, are: **Desmond Stolz**, vice president, who continues as works manager; **J. T. Collins**, chief sales engineer; **E. W. Bruss**, chief electronic engineer; **W. R. Hoff**, comptroller; **W. C. Conarchy**, resale parts and service manager; and **R. L. Sutton**, chief draftsman.

Thomas E. Wilson was appointed production manager of the GMC Truck & Coach division, **General Motors Corp.**, Pontiac, Mich. **Earl A. Maxwell** will succeed Mr. Wilson as director of personnel.

Walter L. Luli was named chief engineer of the coach division of **White Motor Co.** His headquarters are at the coach plant, Cleveland. **William G. Sternberg** was elected a vice president,

in charge of the Sterling Division. He was president of **Sterling Motor Truck Co.**, Milwaukee, which firm was acquired by White and which is now a division of the company. Other appointments to the Sterling Division are: **Ernest R. Sternberg**, named general manager, and **J. P. Dragin**, appointed vice president in charge of finance.

W. H. Neptun was promoted from assistant factory manager to factory manager of **Hyster Co.'s** Peoria, Ill., manufacturing plant.

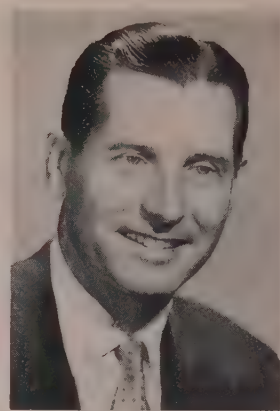
R. L. Howes was named manager of quality and standards, a new activity of **General Electric Co.**, X-Ray department, Milwaukee. He is succeeded by **Richard C. Ehrman** as manager of employee and community relations.

Roger H. Brown was appointed eastern district manager for the **Warner Electric Brake & Clutch Co.**, Beloit, Wis. He formerly had been in charge of the company's operations in New York, Philadelphia and Washington.

Douglas Aircraft Co. Inc., Santa Monica, Calif., appointed **John C. Buckwalter** chief engineer of the Long Beach division, succeeding the late **Fred J. Stineman**. Mr. Buckwalter was formerly assistant to vice president-engineering.

Two plant superintendents appointed by **National Lead Co.** are: **William F. Jones**, promoted to superintendent of the Boston plant to succeed **Herbert Shattuck**, retired; and **Harvey Morgan**, named superintendent of the Buffalo plant.

Robert N. Nelson was named assistant sales manager, pneumatic division, **Sundstrand Machine Tool Co.**, Rockford, Ill.



WALTER T. MORELAND

... Lone Star Steel V. P.-sales

Lone Star Steel Co., Dallas, elected **Walter T. Moreland** to a new post, vice president in charge of sales, and named **John B. Connally Jr.** to its group. Mr. Moreland has served as general sales manager since May, 1950.

Harry T. MacMillan was appointed western service engineer, **Thomas Associates**, Los Angeles.

John M. Martin was named assistant general manager of the explosives department of **Hercules Powder Co.**, Wilmington, Del.

Ralph C. Edgar was appointed director of industrial, personnel and public relations for **Ball Brothers Co. Inc.**, Muncie, Ind., and its subsidiaries. Mr. Edgar resigned as personnel director for **Allegheny Ludlum Steel Corp.**, Pittsburgh, to join Ball.

C. S. White was appointed manager of the eastern division of **Dearborn Chemical Co.**, with headquarters in New York. He succeeds the late **Herbert J. Cornell**.

Lawrence H. Smith was appointed executive vice president, **Chicago Steel Tank Co.**, Chicago, recently acquired by **Pressed Steel Car Co.**

R. G. Sullivan was placed in charge of the expanded West Coast operations of **Reeves Pulley Co.**, Columbus, Ind.

A. R. Booker was elected executive vice president and general manager of **Electrofilm Corp.**, Los Angeles, to succeed **W. G. Andrews**, resigned.

Herbert E. Gallison was appointed manager of the industrial mixer sales division, **Worthington Pump & Machinery Corp.**, Harrison, N. J., with headquarters at the Dunellen, N. J.,



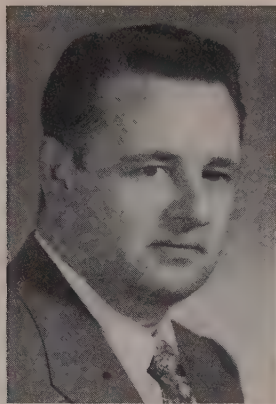
WALTER L. LULI

... chief engineer, White coach div.



WILLIAM G. STERNBERG

... V. P. White Motor Sterling Div.



JOSEPH N. RYDER

... United Mfg. sales mgr.



M. W. TOWNSEND

... directs sales, Handy & Harman



VINCENT LYSAGHT

... AC&C Helicoid Gage sales mgr.

plant. He succeeds J. C. Lukas, resigned.

United Mfg Co., Bedford, O., appointed **Joseph N. Ryder** as sales manager. Mr. Ryder joined United Manufacturing about a year ago.

Handy & Harman appointed **M. W. Townsend** to take over the direction of sales for products used in the arts and industrial fields. His headquarters will be at the company's general offices in New York. He was assistant to vice president—sales.

Vincent Lysaght was appointed sales manager of the **Helicoid Gage Division**, American Chain & Cable Co. Inc., Bridgeport, Conn. He was formerly sales manager of Campbell Machine Division and Wilson Mechanical Instrument Division.

OBITUARIES...

Alfred G. York, 57, a director and vice president of **Watson-Stillman Co.**, Roselle, N. J., died July 22. He had been associated with the concern since 1918. In 1941 he became vice president and general sales manager, and in 1945 was elected to the board.

Chester P. Clingerman, 67, who retired six years ago as superintendent of U. S. Steel Co.'s **Carrie Furnaces**, Rankin, Pa., died July 22. He had served as superintendent for 20 years before retirement.

W. Wallace Kellett, 59, president, **Kellett Aircraft Corp.**, North Wales, Pa., and a director and former board chairman of Republic Aviation Corp., a pioneer in autogiro and helicopter production, died July 22. He founded Kellett Aircraft in 1928 and remained its president for 23 years.

Joseph H. Towle, 62, in charge of the Philadelphia office of **Tool Steel Gear & Pinion Co.**, Cincinnati, for over 20 years; senior member and founder with his late father of **Towle & Son Co.** of Philadelphia, died July 12 in Philadelphia.

Raymond J. Southwell, 64, formerly general sales manager of **Wickwire Spencer Steel Co.** of New York and the **Andrew Campbell Division** of

American Chain & Cable Co., Bridgeport, Conn., died July 14 in Bridgeport.

Ralph S. Fetter, 69, president and general manager of the **Fetter Steel Barrel Corp.**, Buffalo, died July 16.

George G. Heidlauf, former vice president of **Smith & Caffery Co.**, Syracuse, N. Y., died July 16. He had retired from the company last August.

Frederick T. Holliday, 52 president of **Monarch Steel Co.**, Hammond, Ind., and vice president of **William J. Holliday Co.**, Indianapolis, died July 15 in Indianapolis.

C. A. Schiebert, 41, president and a founder of **Metal Stamping & Engineering Co.**, Milwaukee, died July 18.

Edward Rogan, 71, retired mill superintendent for **Habirshaw Cable & Wire Corp.**, Yonkers, N. Y., died July 21.

Clarence D. Carlson, 68, sales engineer, **Nottingham Steel Co.**, Cleveland, died July 22.

Ralph H. Whisler, 64, chief experimental engineer for **Hudson Motor Car Co.**, Detroit, died July 9.

Arthur A. Schrage, 71, vice president

and general manager of **Detroit Steel Corp.**, Detroit, until he retired in 1944, died July 11.

J. Fred Mowat, 68, a member of the engineering department, **United States Steel Corp.**, Chicago, died at his home in La Grange, Ill., July 18.

Peter Kruse, 77, chief engineer and designer for the **Hamilton-Kruse** branch of the **Baldwin-Lima-Hamilton Corp.**, Hamilton, O., died July 16 at his home in Brooklyn, N. Y.

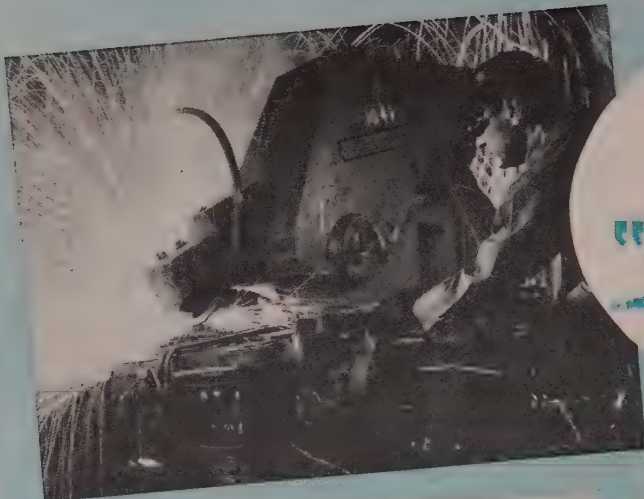
Fred H. Brussel, 61, owner of **Central Pattern Mfg. Co.**, Detroit, and **Numatic Mfg. Co.**, Milford, Mich., died July 16 in Milford.

Samuel S. Ireland, 70, who founded **Rolled Metal Products Co.**, Toronto, Ont., in 1921, and headed it until retirement a year ago, died July 17.

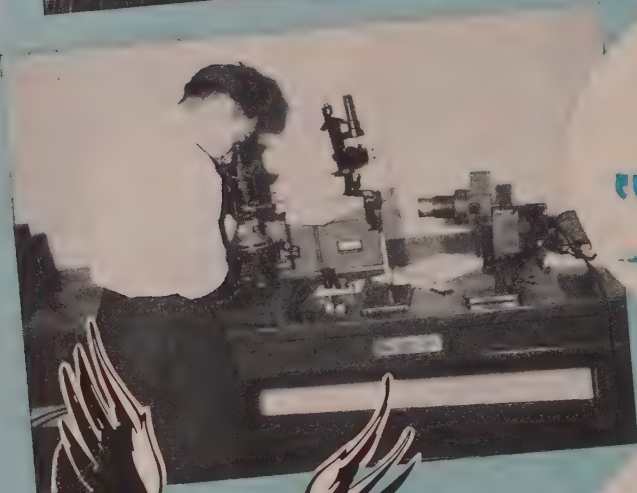
Arthur J. Thompson, 54, president, **Endicott Forging & Mfg. Co.**, Endicott, N. Y., died July 18. He was named president in 1947 and was formerly comptroller.

Walter E. Spindler, 65, president, **Aluminum Specialty Co.**, Manitowoc, Wis., died July 20.

Carl W. Benz, executive vice president, **International Railway Car & Equipment Mfg. Co.**, Kenton, O., died July 15 in his home in Hammond, Ind.



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OXYGEN BLAST FURNACES—Two 100-ton low-shaft oxygen-enriched blast furnaces are being erected in Europe, one at Oberhausen, Germany, and the other at Ougree, Belgium, under sponsorship of the Office of European Economic Co-operation (representatives of European countries receiving Marshall Plan aid). Eight countries are joining in the research program tied into the two furnaces, some results being expected from the German installation this fall. Described by European scientists as the "first international research project in metallurgy", the undertaking drew refusals from several U.S. steel companies which had been invited to participate.

ANNEAL IN VACUO—Bright annealing in an electric furnace without the need for a protective atmosphere can be accomplished by means of placing parts in hermetically sealed pots and connecting the latter to a vacuum pump before placing in the furnace. Equipment is described in the British industrial press where it is noted that any drawing compound present on the parts will be extracted by the pump which can be continued in operation during the annealing cycle.

14,000 PAGES ON ONE STAMP—New technique in high resolution photography permits reducing the size of a typical book page of print to proportions making it possible to accommodate 14,000 complete pages on an area the size of a postage stamp. The system is the result of 17 years of research by a British scientist, now in this country. Another of his novel brain children is a linear scale, made in lengths up to 2 feet, accurate to within 0.00003-inch in the overall length. It carries lines spaced at 0.001-inch and is numbered at intervals of 0.050-inch.

CLEAR OIL FOR GRINDING—Transparent soluble oils, as against soluble oil emulsions, are normally "synthetic detergents" since they contain no petroleum-type oils. They are expensive, two to four times the cost of mineral oil type soluble oils. Like all detergents, they have excellent cleansing or washing ability, washing away lubricating oils on moving surfaces and causing sticking if allowed to come in contact with such surfaces. For this reason the use of transparent soluble oils usually is confined to certain types of grinding operations, or on certain machine tools where there is no danger of washing out lubricating oil.

SHAPE AFTER ENAMELING—Porcelain enameled steel that can be formed after firing, a long-sought goal, is in process at the plant of a leading stove manufacturer. Key to the method is a thin coating, only 0.003-inch thick. Liner panels of 24-gage steel, for example, are placed on a cable

conveyor, coated on one side by an automatic spray and a light reinforcing coat applied by hand sprayers to the ends which become sides after forming. Following firing, the panels can be stored in the flat until required in the fabricating line where the only precaution is the provision of a fairly large radius of curvature for 90-degree bends.

GAS SCRUBBING—Removal of micron-size solids from effluent furnace gases by directing the latter through a venturi scrubber using high pressure water jets in the venturi throat is being accomplished effectively in a number of installations. Attractively low capital equipment costs combine with power costs somewhat on the high side. —p. 70

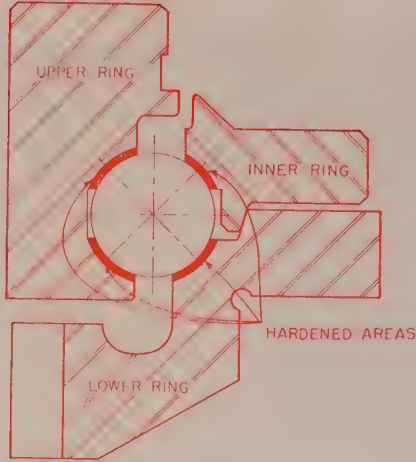
QUICK HARDENING RACEWAYS—Induction hardening ball races of an 80-inch turret for a new model combat tank at a speed of almost 1 inch per second made the former flame hardening arrangement obsolete in a hurry. However, design of the equipment, particularly the inductor shoes, was a tough engineering assignment. To bring 4140 steel up to the hardening temperature in the short time involved, and keep the heat concentrated on the narrow bearing area, many precautions were necessary—plus a lot of experimentation. —p. 64

ARCS HARD AT WORK—Electric steelmaking capacity by the end of last year topped 6.8 million tons annually and was still going up. There are those who think it may graze 10 million tons a year by 1953; and there are also those who would like to know where all the high-grade steel scrap is coming from to support a further increase of this handsome proportion. The answer may be some form of triplexing process involving the blast furnace and the bessemer, but it is not apparent yet. An electric furnace shop, with two 70-ton top-charge units and auxiliary equipment capable of producing 20,000 tons of carbon steel ingots a month, calls for an investment of around \$2.5 million. —p. 74

DOING IT BETTER FOR LESS—Wax emulsion used in drawing hot rolled 0.030-inch stock (p. 67) has a solid content of 23 per cent, pH of 8.5, normal film thickness 0.001-inch or less, drying upon evaporation of water in 7-15 minutes and covering 2000 sq ft per gallon . . . Change from the conventional twist drill to a fluteless type with a notched carbide cutting lip (p. 80) facilitated high speed drilling through plastic materials, cutting down on heat resulting from flute loading while the carbide took care of the abrasive action of the material . . . Picking up parts coming off screw machines by an elevating belt and then dumping them onto conveyor belt fixtures for transfer through degreasing and inspection cut handling time in half (p. 68) at a camera manufacturer's plant. —A.H.A.

Induction Hardening

Concave surfaces of three 80-inch diameter SAE 4140 ball bearing races are hardened and quenched in less than 5 minutes each, replacing flame hardening



Sketch showing full-size cross-section of three rings comprising ball races for tank turret. Darkened areas are hardened by induction to 42-47 Rockwell C, the SAE 4140 rings untreated averaging 28-29

By A. H. ALLEN
Associate Editor

CRITICAL element in any combat tank is the bearing support for the turret, usually an arrangement of large-diameter balls and hardened races, the latter in the form of inserted contoured rings. Not only must a precision fit between hull and turret be maintained along with adequate support for the heavy cast armor plate turret, gun and counterbalance, but also the race surfaces must be hardened properly so there will be no "Brinelling" in transit or scoring or flaking in field service, under the worst possible conditions of dust, uneven terrain and other combat hazards. Any sloppiness in the fit between turret and hull will at once throw out the delicate fire control equipment operating the tank cannon, and might also interfere with smooth operation of the revolving turret itself.

In the T-41 Walker Bulldog light tank, the turret bearing assembly comprises three rings of SAE 4140 steel, rough and finish machined and ground to the contour shown full size in an accompanying sketch. The rings, approximately 80 inches in diameter, ride on a series of 1½-inch ball bearings and require careful hardening of the blackened areas as shown to 55-60 Rockwell C and drawing back to 42-47. The stock averages 28-29 Rockwell C. Originally, this was done by rotating the rings under properly positioned flame hardening torches, a full circuit of one ring requiring 66 minutes—and that was considered fast time.

Equipment now has been built by the Tocco Division of Ohio Crankshaft Co., Cleveland, for doing the job by electric induction heating at a speed of 0.9-inch per second, or something under 5 minutes for a complete ring. The setup involves placing the ring in a fixture on a rotating support inclined at an angle of 15 degrees and mounting the stationary induction head inside the ring at a point about 45 degrees up from the lowest point of the circumference, this to allow ready drainage of quench solution.

The induction head is unique in design, comprising a flat L-shaped arm which can be swung up away from the ring through a crank and rack and pinion

arrangement in the inductor cabinet. The arm carries a 2-inch copper shoe conforming to the concave curvature and width of the area to be hardened. The problem of creating a proper induction pattern to force flux into the ring so that it is heated rapidly to the right temperature was not an easy one to solve. A most important factor is the air gap between the inductor shoe and the ring, this being held to 1/32-inch. Hold-down rollers ride the top surface of the ring a short distance either side of the inductor to prevent variation in the air gap.

The three-rings—known as upper, lower and inner—because of their varying contours, require differently shaped inductor shoes, the upper ring, for example, having two surfaces to be hardened, the inner and lower rings only one. These shoes are quickly detachable from the inductor arm and carry on their "trailing" edge a specially drilled block through which soluble oil quench solution may be directed in 1/16-inch streams onto the heated area immediately after it passes under the inductor shoe. Pressure of 10 psi is maintained on the quench for inner and lower rings, 15 psi on the upper ring because of the dual hardened tracks.

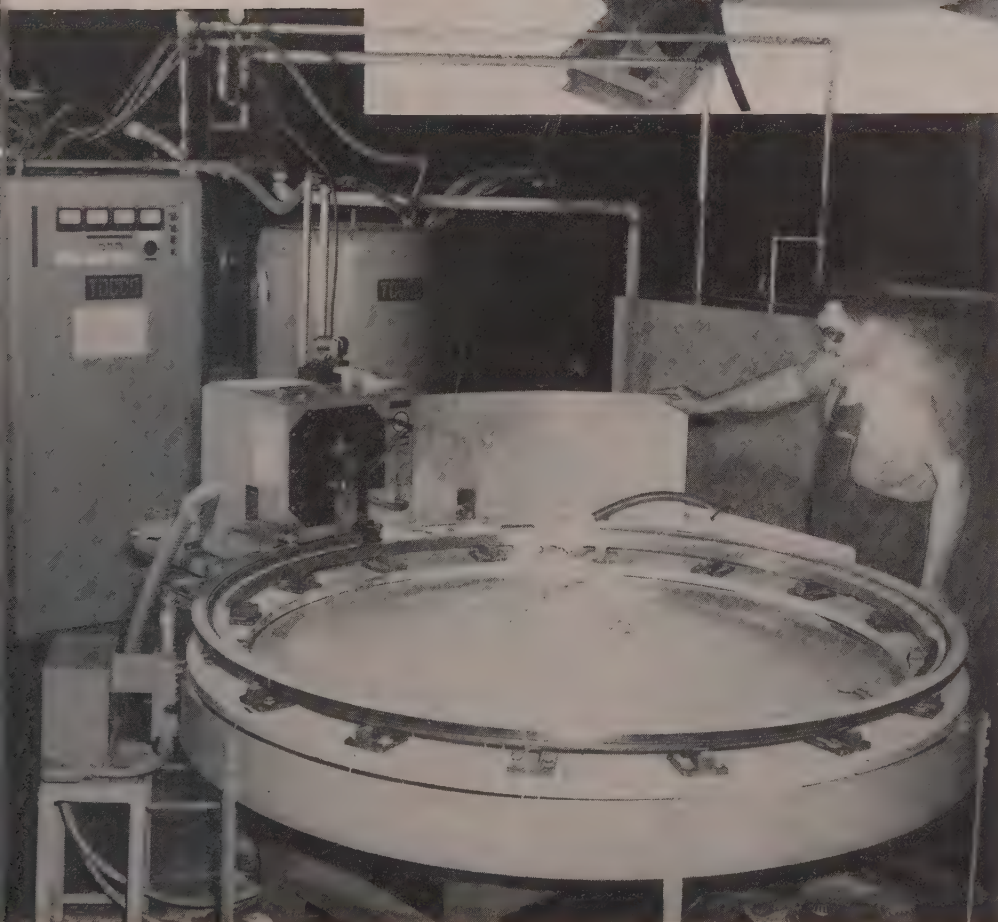
Both the inductor arm and shoe are cored for water cooling, and a separate pumping and temperature control system is installed to supply this water at 60 psi pressure and a maximum of 80° F temperature. The same water also is circulated around the transformer supplying current to the induction head. A separate temperature control arrangement provides for maintaining the soluble oil quench solution at a constant 94° F.

Capacity of the generator is 140 kw, sufficient to supply three induction hardening stations which eventually will be set up to handle the three rings simultaneously. The lower race requires 36 kw, the inner 35 kw and the upper 70 kw.

Control of the entire operation is through a series of conveniently located pushbuttons which provide for starting, stopping or recycling the positioned rings, and turning on or off power to the inductor.

Tank Turret Bearing Rings

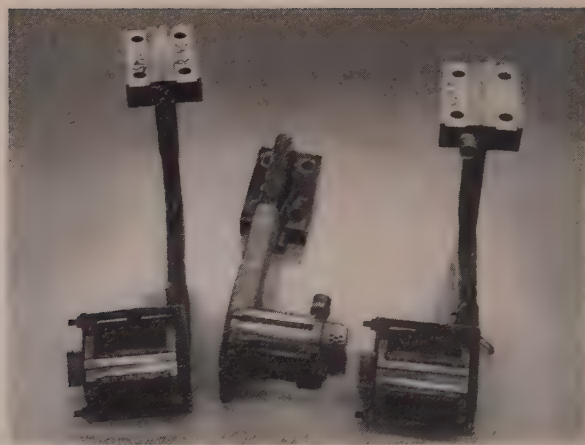
Revised design of fixture for rotating ring under induction head at speed of 0.9-inch per second. Fixture is tilted to obtain good drainage of soluble quench solution



This was the original hardening set up, with the induction head outside the ring and the fixture horizontal. In the background is the transformer which supplies current to three hardening stations. To its right is the cylindrical cooling water temperature regulator; behind the operator is temperature control tank for the quench solution



Overlap of the hardened area when the ring has made a complete circuit under the induction head must be watched closely and is held to a minimum. This was accomplished more readily than with the previous flame hardening. Control also must be exercised with regard to hardness carrying over the edges of



Left—Here is a closeup of the inductor head and shoe, with the ring moving beneath it and sprays of quench playing on the concave heated surface. Flat arm carrying the inductor shoe is water cooled

Above—Three types of inductor arms and shoes are required for the three different rings treated. The face clears the ring surface by only 1/32-inch in operation, essential to forcing sufficient flux into the steel to bring it to heat

the concave bearing areas, to avoid the danger of cracking. This overlap must not exceed 1/8-inch, with minimum of 35 Rockwell C hardness. The hardened rings are Magnafluxed 100 per cent to detect any microscopic cracks in this critical zone. Should they appear, the rings are either scrapped or reworked if possible, because small cracks of this type are focal points for fatigue failure. The rings are finish machined with an allowance of 0.030-inch of stock for removal by grinding after the hardening and drawing operations.

Thin Ceramic Coatings on Turbojet Engine Parts Yield Alloy Savings

CERAMIC coatings varying from 0.0005 to 0.003-inch thick for application to jet engine components subject to heat and corrosive effects of gases have been perfected by Solar Aircraft Co., San Diego, Calif., as the result of research initiated in 1946. Solar is a large supplier of welded sheet metal elements such as combustion chambers and liners, diffuser cones, nozzle boxes, tailpipes, afterburners, exhaust manifolds and rocket nozzles, normally made of superalloys containing large percentages of nickel, chromium, cobalt, tungsten and other critically short metals. With ceramic coatings, conventional stainless steels can be substituted.

Service life of jet components coated by the "Solaramic" process also is claimed to be extended appreciably and since many of them have relatively short life stocks of spares possibly can be reduced as overhauls become less frequent.

Similar to Enameling—The process starts with mix-

ing and melting together such ceramic materials as clay, borax and silica, the fused smelt being shattered into small pieces known as frit. As in conventional enameling practice the frit is milled with water, binder and other materials to form a paint-like coating, into which parts are dipped and subsequently fired at 1300-2400 °F. Undisclosed secret of the process is the complete composition of the coating, which will withstand temperatures of a reported 1800°F after firing.

National Bureau of Standards has developed a similar process, but Solar claims its system has more universal application, being suited to use on nearly any base material. Control of coating thickness, another virtue of the process, is said to be possible to "amazingly" close tolerances.

John V. Long, director of research for Solar, has supervised the development work on the process since its inception.

Wax Emulsions Effective as Drawing Lubricants



Auto radio casing, changed from terne plate to hot rolled pickled and oiled stock, in the drawing of which wax emulsion lubricant minimized breakage

SPECIAL wax blends for use as lubricants in metal forming operations, such as stamping, wire drawing and cold heading, are finding increasing applications, with favorable results reported. In one case, Judson & Rose Inc., Philadelphia, had been drawing terne plate into casings for automobile radios, using a 200-ton crank press with 8-inch stroke and maximum speed of 35 strokes per minute. When terne plate became scarce a change was necessary to hot rolled pickled and oiled stock, 0.030-inch thick, annealed to Rockwell B 55 and an Olsen cup test rating of 355-360. Prohibitive breakage began to be encountered until it was suggested that a wax lubricant be tried.

A creamy, aqueous wax emulsion, furnished by S. C. Johnson & Son Inc., Racine, Wis., and identified as No. 150, was rubbed well into the sheets with a cloth pad so as to break through the mill oil coat. A total of 65 draws was completed with no breakage. Engineers immediately began tests to find further application where wax lubricants might facilitate a switch to metals which are in more plentiful supply than stainless steels and alloys, for example.

Metal Flow Is Aided—It is claimed the wax compound has the ability to "stay with" the metal on which it is applied even under high heat and pressure conditions, thus facilitating metal flow during a draw to produce smooth, gall-free surfaces and well formed angles, curves and corners. In some instances it permits multiple draws without reapplication and may reduce work hardening to the point where annealing is unnecessary. It may be used in drawing, stretch forming, bending, reducing, swaging, coining and cold heading of carbon and stainless steel, aluminum and magnesium alloys. Application is by dip, spray, sponge, brush, roller coating or other common methods.

The emulsion is nonflammable, with pH of 8.5 and solid content of 23 per cent. Normal film thickness

is 0.001-inch or less, drying upon evaporation of water in 7-15 minutes. Coverage is up to 2000 square feet per gallon undiluted. On less severe draws, dilution with from one to three parts water is feasible.

Where possible, precleaning and precoating of the stock will give the best drawing performance and minimum use of lubricant, also contributing to cleanliness around machines. Waxed stock should be thoroughly dry before stacking and when dry can be stacked and stored indefinitely, the film affording some degree of protection against corrosion and dirt. On simple draws where the lubricant is diluted, operations can be handled wet, although the application should be sufficiently thorough to break through any oil film that may remain on the stock. The lubricant can be removed by standard methods on conventional degreasing equipment without interfering with subsequent paint adhesion or electroplating.

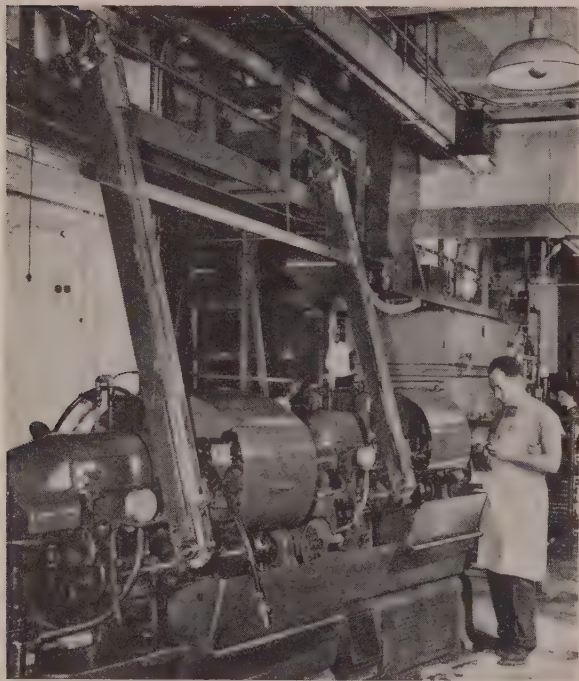
Use Paste on Bolt Wire—In a test at a plant cold heading wire for wheel bolts, experiments were made with a specially prepared paste wax, using it to coat wire in the die box and incorporating aluminum stearates as a coagulant with a small concentration of lime. As a result of this procedure, a dry wax film was applied to the wire which minimized lime flaking and provided a finish offering considerable resistance to corrosion resulting from moisture condensation during storage. Over 150 tons of wire thus treated has been processed into bolts.

Another instance showed that the torque required to drive self-tapping screws could be reduced an estimated 50 per cent by coating the screws with wax emulsion.

Tests with wax lubricants on stainless steel wire are being aimed at the elimination of copper flashing normally applied to the wire as a lubricant in cold heading, both for improving the quality of the draw and extending life of tools and dies.

CONVEYOR SYSTEM

Handles Screw Machine Parts 50% Faster



Conveyor and degreaser system virtually eliminates handling of parts produced by automatic screw machines. The system combines elevator belt, horizontal belt and link chain conveyors to move parts from automatic screw machines to final inspection



Finished parts move at convenient level over inspection bench. Parts are carried in slings on sprocket-driven link chain conveyor from degreaser

A NEW conveyor system is speeding production at Eastman Kodak Co.'s camera works. The specially designed unit eliminates much handling of parts produced by automatic screw machines used in the production of defense materials. Combining elevator belt, horizontal belt, and link chain conveyors to move parts from the automatic screw machines to the final inspection bench, the new system cuts total handling time by almost half.

A difficult handling problem connected with a daily production of several thousand parts for a Department of Defense project inspired design of the new equipment. The parts, produced from 1½-inch brass rod, are approximately 11/16-inch long. Despite their small size, each piece weighs more than a quarter of a pound—totaling up to over a ton in each daily handling.

How It Works—The conveyor system was originally conceived by screw machine department supervision. It was designed, constructed and installed by Cross Brothers Co. of Rochester, N. Y., with the assistance of the Eastman camera works plant engineering department.

Four screw machines are employed on the project. A bucket attached to the slotting arm on each machine catches the part as it is severed from the bar and transfers it to a chute. Here the part slides by gravity to a point where it is picked up by a cleat which is attached to the surface of a Plexiglas-enclosed elevating belt.

At the top of the rise a stationary cam deflects the part into another chute. It drops by gravity through a 90-degree twist and is deposited flat on an 8-inch belt which runs above the four machines served.

A tripping device at the end of the horizontal belt deposits the parts, one at a time, into swinging wire receptacles mounted on each side of a link chain. A sprocket drive moves the chain through a degreaser and then to the inspection bench. There finished parts are removed from the receptacles by hand, inspected carefully and finally stacked in special trays for shipment.

Hand System Out—Under the old system the parts were placed in baskets at each screw machine. Baskets were transported to wash tanks and dipped by hand. Next they were passed under multiple air jets to remove chips from a blind tapped hole in each part. Then came inspection for dimensional accuracy and hand filing of nicks created in handling. Finally, the finished parts were placed in special trays ready for shipment.

Kodak engineers say the new conveyor unit has been designed so that it can be adapted easily to other production setups in the plant with only minor changes.

By VINCENT SATKOFF
Spares Controlman, Sheared Plate Dept.
United States Steel Co.
S. Chicago, Ill.

ROLLING mill maintenance usually consists of replacing worn out or broken parts with new parts. The "sledge-hammer" machinists in the maintenance gang are capable of doing the work involved in making the replacement. All that is required is the spare part. The large quantity of different parts in the equipment that constitute a rolling mill makes imperative in most cases the use of a blueprint when ordering, checking or identifying spares. The problem is to find the blueprint.

The Maintenance Scorecard, however, brings order out of confusion. It is a complete, simplified listing of the spare parts required for the maintenance of the equipment of a rolling mill, indexed and arranged in a systematic manner. The heading of a page of the scorecard is made up as shown below.

After filling in the page number and the columns headed No., Item, B/P, Pattern and No. in Service, the sheet is reproduced in quantity. The columns headed No. on Hand, Last Date Used, and Remarks/Job No., are left blank and are filled in only on the date to be noted in the upper right hand corner.

parts used individually, parts needed by the shop to repair the assemblies, packing, motors and any part, the lack of which causes irritation and headaches.

The index of the scorecard should be separated into two or three sections to simplify the finding of any particular piece of equipment.

Each piece of equipment is listed in the order of travel of the ingot from the soaking pit to the finishing end shipping dock. Cranes are to be listed by capacity. Some of the equipment can be broken down into units, thus making quicker and easier the selecting of the part.

Various applications of the maintenance scorecard are:

1. To enable anyone to find the blueprint for any part of the equipment of the mill, a necessary requisite for ordering, checking and identifying purposes.

2. To show the status of the spares. This necessary information is required when preparing a contemplated repairs list or making repairs.

3. To show what spares are missing so that they can be expedited.

4. To furnish the necessary information required for expediting spares.

5. To show what spares are missing so that they can be ordered if supervision calls for this action. The spares can be referred to by the number in the first column.

6. To maintain a systematic check on the spare situation by having any sheet or sheets of the score-card filled out on request. (These sheets can be filled out directly from the inventory cards or from the cards plus a field check.)

7. To direct the activities of the spares controlman in keeping track of the spares. When filling out the sheets, he should also make or have made spare parts tags and wire them to the spares. The present location of the spare, which is not always the same as the previous location, then will always be known. Parts removed from service also can be tagged, showing the reason why it was taken out and the repair order number.

8. To know the mill. A review of the scorecard will point out the vulnerable parts of the mill where trouble might occur. The column headed "Last Date Used" will disclose how long a part has been in service and whether it is due to be inspected.

STATUS OF SPARES: SHEARED PLATE DEPARTMENT
3000-TON SHEAR-44" SLAB MILL-ARR'G'T. BP. 42338
A. MAIN 40" PLUNGER-ARR'G'T. BP. 42345

PAGE NO.
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69

Venturi Scrubbers—Efficient, Low

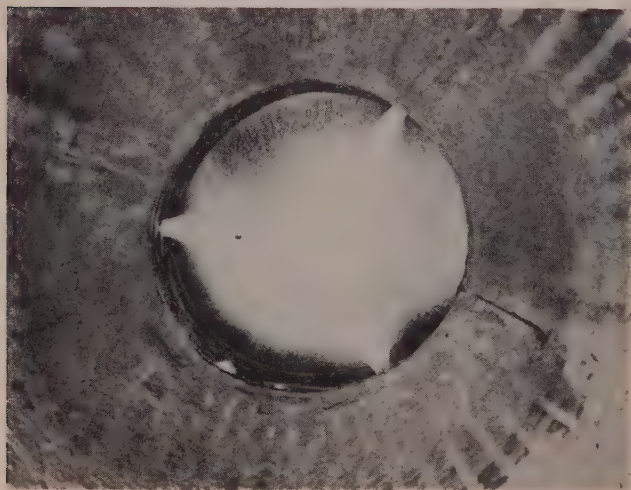
By W. P. JONES

Chemical Construction Corp., New York

IDEALLY suited to many jobs involving control of air pollution by removal of solids down to micron size from effluent gases, the venturi scrubber is a simple device of proved efficiency, moderate in overall cost, simple to operate and maintain. With industrial processes continually changing and the pressure against air pollution building up in many communities, the low capital investment in a venturi scrubber, as against other types of equipment giving comparable results, may appeal to managements despite the somewhat higher power costs entailed. Further, when compared with dry-collection equipment, wet scrubbing methods have the added advantage that absorption of some noxious gases and odors can be effected simultaneously with collection of solids and mists. And in many cases with the venturi principle, the scrubbing solutions can be recirculated, with reduced water requirements, and the concentrations built up for return to process, for less expensive dewatering of solids, or for conditioning before discharge to sewers.

A typical venturi scrubber installation of the Pease-Anthony type is shown in the accompanying sketch. The scrubbing liquid is introduced into, or just ahead of, the venturi throat under low pressure and is distributed to give an apparent curtain of liquid across the throat. The dusty gas, at high velocity, collides with the curtain of liquid which is briefly but violently accelerated and disrupted. The gas decelerates in the diverging section and the fine particulate matter in the gas is wetted by the finely atomized droplets.

Looking downstream into the venturi throat, with high-pressure water jets in action, giving curtain effect across the opening



Then, coalescence occurs downstream, resulting in drops of liquid large enough to be separated from the gas by centrifugal force.

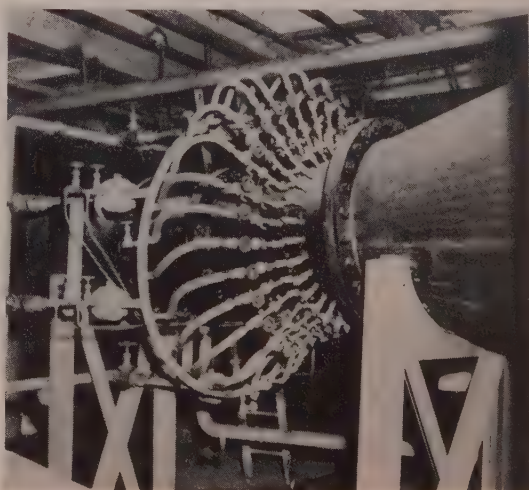
An illustration gives a look downstream into a venturi throat 5½ inches in diameter. Water issues as solid streams from the flush ends of 0.27-inch ID tubing perpendicular to the wall, at jet velocities of 17 feet per second. Air velocity is about 92 feet per second in this instance. Gas impinges on the upstream surfaces of the jets, seeming to part them down the middle. Drops torn off move under their initial momentum as modified by the gas velocity. Here, with low gas velocity, most of the drops are relatively large and the paths are fairly straight.

With higher gas velocities the liquid is thoroughly atomized and the initial solid jet of water is dispersed to give an apparent "coverage" in the throat. Probably the larger drops are first flattened by high velocity, then made cup-shaped. Edges of the cups are drawn out into filaments which finally break off into droplets, having at least momentarily an expanded surface area.

Jets on a venturi scrubber used on the effluent from an open-hearth furnace in which oxygen is injected to speed up the scrap meltdown are shown in another illustration.

An accompanying table summarizes data on dusts and fumes for three installations where the venturi scrubber has proved successful. Large particles present no problem, but small particles of the size shown

Multiple water jets on a scrubber handling gases from an open-hearth furnace in which oxygen is injected to speed up scrap meltdown



ost Gas Cleaners

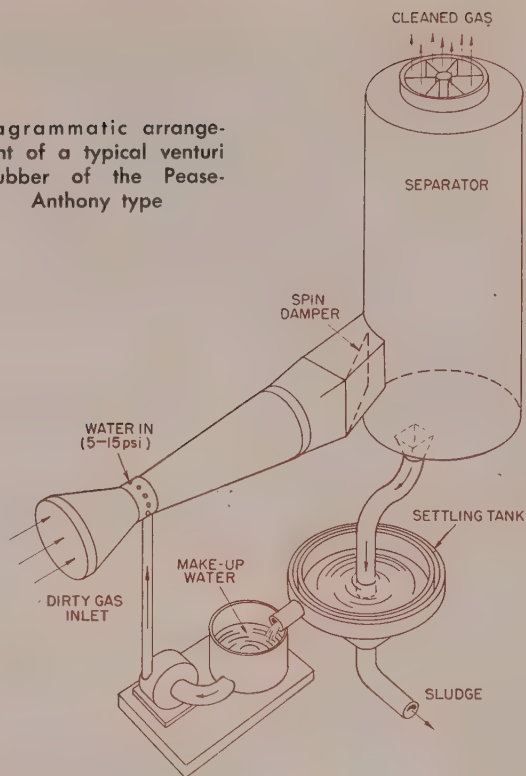
n two electron photomicrographs reproduced here-
with are more difficult to collect.

The first line of the table relates to collection of red iron oxide fume given off by the open-hearth furnace in which pure oxygen is injected by lance into the molten metal to speed up the reactions. One photomicrograph shows the original dust condition. When the venturi scrubber first went into service the improvement in appearance of the brick red cloud was spectacular. Previously, the cloud carried for miles, was a real nuisance and persisted for a matter of hours during each heat. With the scrubber, high efficiencies were realized, both by eye and on the usual weight percentage basis. During warm weather, an occasional thin pink haze comes from the stack, but during much of the time nothing can be seen. In winter, it is a pink or white mist plume which soon vaporates and disappears.

The second line of the table gives data on collection of mixed iron and zinc oxides from an open-hearth furnace in which galvanized steel scrap is charged. The other photomicrograph shows these mixed, ultra-fine solids comprising the normally dense, white, sometimes brownish and reddish, cloud which pours from such a stack during the charging period. A pilot investigation on this material proved that the scrubber eliminated virtually all visible discharge.

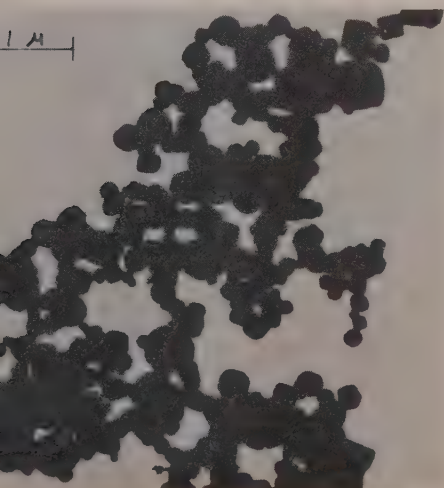
The third line of the table refers to work on blast furnace gas. The venturi has several advantages over a primary tower-type scrubber for this service. First, it gives cleaner gas. For example, on eight sets of simultaneous inlet and outlet samples where the inlet samples ranged from 4 to 15 grains per standard cu ft,

Diagrammatic arrangement of a typical venturi scrubber of the Pease-Anthony type

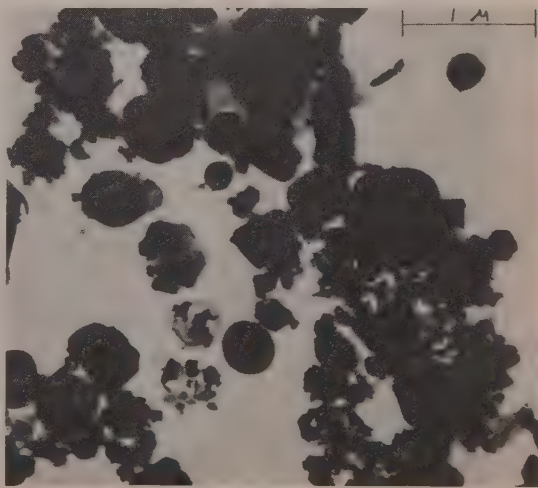


the outlet loadings ranged from 0.009 to 0.08 grains per cu ft. Second, there are no inaccessible spray nozzles to maintain, and this is important because blast furnaces must operate continuously for years. Third, the dust is concentrated into much less water, thus facilitating reclamation. From investigations thus far it appears the venturi scrubber is a superior primary washer at moderate pressure drops where secondary cleaning follows, and may combine the functions of a primary washer and a fine gas cleaner when operated at the higher pressure drops.

Consideration of experimental and plant scale work



Electron photomicrographs of dust particles, the one at the left being a sample from the open-hearth furnace in which oxygen was being injected by lance, the other from an open hearth in which galvanized scrap was being charged. Size of the particles can be judged from the scale representing one micron



DUST RECOVERY WITH VENTURI SCRUBBER

Source of Gas
Open hearth, oxygen lanced
Open hearth, galvanized scrap
Blast furnace

Dust
Iron oxide
Iron & zinc oxides
Iron ore and coke fines

Particle size,
microns
0.02-0.50
0.08-1.0
0.5-20.0

Dust Loading,
grains/cu ft

Inlet	Exit
1-6	0.01-0.07
0.5-1.5	0.03-0.06
3-24	0.008-0.05

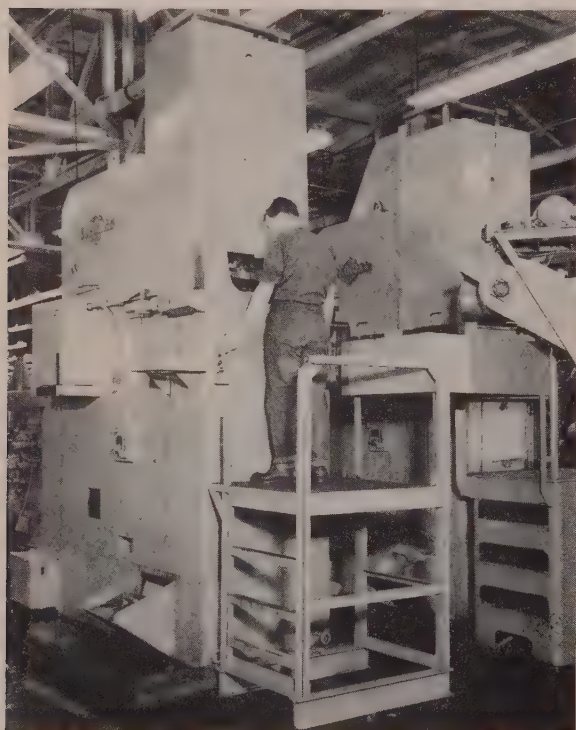
Average
removal
efficiency, %
99
95
99+

which has been done on absorption of various gases indicates that the venturi scrubber method has an interesting future where true counter-current flow is not required. The time of contact is small, it is true, but as with heat transfer and other mechanisms the turbulent high velocity mixing in the throat region yields excellent transfer effects.

Most of the pilot work has been done with a venturi scrubber discharging into a cyclonic spray scrubber, the spray nozzles of which can be operated or not. In virtually every case, when the spray nozzles were operated, some increase in efficiency was noted, but in most cases the venturi scrubber alone has given acceptable efficiencies.

High-Precision Gear Broaching

FINISHING gears to an involute tolerance of ± 0.0002 -inch by broaching is something that would have been considered impossible only a few years ago. Here is a 25-ton Colonial broach installed at Chevrolet-Cleveland which processes oil pump internal gears for auto-



matic transmissions four at a time and within the tolerance mentioned. Machine, requiring only a minimum of floor space, is the pulldown type with automatic broach handling, so the operator does not have to touch the broaches. Stroke is 48 inches, with two

broaches used and two parts stacked at each station. An automatic shuttle-type fixture is used which, at the end of the power stroke, shuttles toward the operator for unloading and reloading while the broaches return to the starting position. The broaches were designed by Colonial Broach Co. so as to cut the teeth and finish the inside diameter simultaneously, concentric with the outside diameter and pitch diameter. Originally it had been planned to shave the gear after broaching, but the accuracy and quality of the finish made this unnecessary.

Metal Cleaning Booklet Reissued

Oakite Products, Inc. announces the publication of a new edition of the 44-page illustrated booklet, "Some Good Things to Know About Metal Cleaning," reviewing metal cleaning in all its many phases. The booklet discusses the wide variety of soils resulting from such metal-fabricating processes as heat-treating, forging, rolling, stamping, drawing, extruding, spinning, grinding, machining, buffing, etc., then describes specific materials, equipment and procedures for the removal of these soils.

Among the many metal-cleaning and related operations reviewed in detail by the booklet are: Tank cleaning methods, machine cleaning methods; electrocleaning steel; electrocleaning nonferrous metals; pickling, deoxidizing, bright dipping; prepaint treatment in machines; prepaint treatment in tanks; paint stripping; steam-detergent cleaning; barrel cleaning; burnishing; cleaning in hard-water areas; treating water in paint spray booths; rust-prevention procedures; machining and grinding. Companies desiring free copies of the metal cleaning booklet may obtain them by addressing Oakite Products Inc., 134E Thames St., New York 6.

Stud Welding Manual Offered

A 32 page, pocket-size stud welding operating manual is issued for industry use by KSM Products Inc., Merchantville, N. J. Manual is directed to the operator of the equipment. Featured is a step-by-step photographic explanation of how to stud weld. The sequence includes 14 photographs of the actual stud welding process.

Other data, supplemented by appropriate diagrams and pictures, includes a description of stud welding equipment and accessories; directions for hooking up the equipment; and approximate generator and timer settings. The booklet concludes with sections on how the weld is made, types of welds you can get, and do's and don'ts of stud welding. A copy of the manual may be obtained by writing to: Engineering Department, KSM Products Inc., 6512 Park Ave., Merchantville, N. J.



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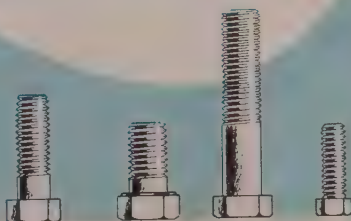
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ARC FURNACE

CAPACITY... A Greater Gain than Other Steelmaking Processes

Many electric furnace shops can now compete with open hearths using the cold melt process for producing rimming steels of ordinary carbon grades

A BIG EVOLUTION—perhaps even revolution—is going on in steelmaking.

Electric steelmaking capacity in 1950, at 6,871,290 tons, was 393 per cent greater than in 1920. Open-hearth capacity rose only 78.3 per cent in that 30-year span, while the bessemer potential dropped 60.1 per cent. The accompanying chart shows the changing importance of the three major steelmaking processes over the years.

Higher and Higher—As late as 1915 annual steel production by the electric arc furnace process was only about 50,000 tons. World War I pushed production to 502,152 tons and World War II saw output soar to more than 4.5 million tons, in 1943. Last year arc furnace production hit an alltime high of 6,039,008 tons of ingots and castings. Capacity will continue to increase, to about 10 million tons by mid-1953 (see the cover).

Why the trend toward electric steel? Few proponents of the arc furnace process make the claim that electric steel generally is cheaper than the open-hearth product, although they do argue that costs for some grades are comparable. What's more, electric steelmaking is totally dependent upon scrap, one of the scarcest metalworking materials today.

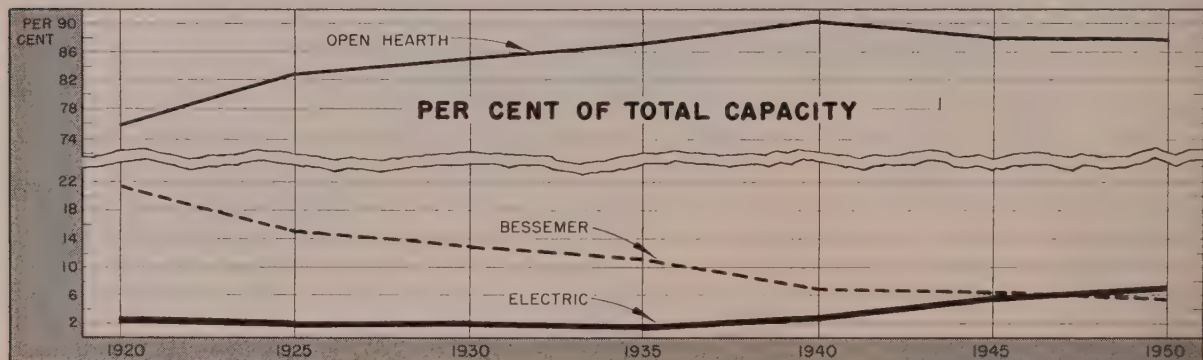
The Whys and Wherefores—Despite some of the drawbacks in the technique, electric steel capacity is being increased more rapidly percentagewise than is the capacity available in any other process. Here are the major reasons why: The steel shortage has



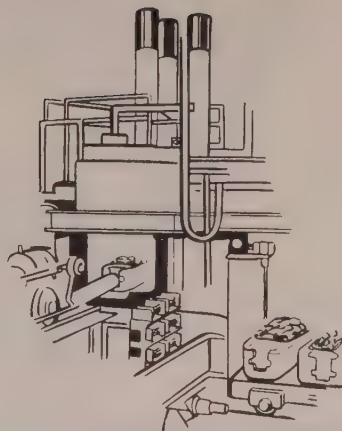
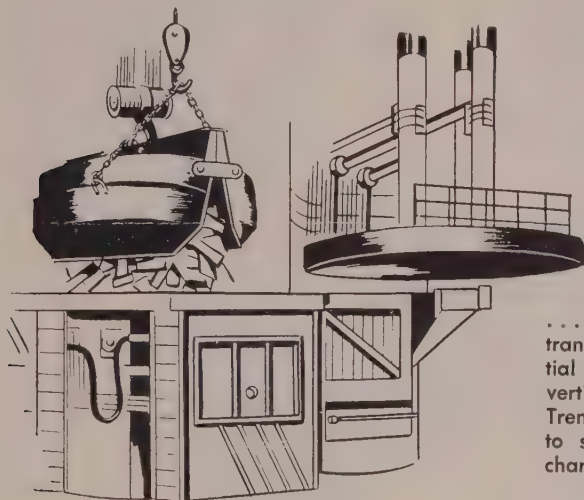
put the premium on fast expansion of steel facilities—electric capacity can be put in more quickly than open hearth or bessemer; the steel shortage has been especially severe on areas remote from big steelmaking centers—electrics are ideally suited for such regions since they thrive on small-scale production and need only scrap and electric power, not the coke, ore and limestone that those regions usually lack; an electric melt shop can be built for about half the investment required for an open-hearth shop with the same monthly

ingot capacity; technological developments have made electric steelmaking more flexible and cheaper than just a decade ago.

The steel shortage has forced many companies to install electric capacity near where primary ingot facilities already exist. Those firms include West Virginia Steel & Mfg. Co., Atlantic Steel Co., Connors Steel Co. and Ingersoll Products Division of Borg-Warner Corp. Some steelmen think the electric arc process's greatest future expansion will be in the remote areas—if there's plenty of scrap and electric power. Firms that foresee a good future for electrics in distant regions include Sheffield Steel Corp. which is building at Kansas City, Mo., and Houston; Hoşter Steel Corp. at Oklahoma City; Seidelhuber Iron & Bronze Works Inc. at Seattle; and R. G. LeTourneau Inc. at Longview, Tex. Like so many companies installing electrics, LeTourneau will produce primarily for its own use. Harry W.



More than half of the operating time of an electric arc furnace is taken up by side-charging: Scrap is first loaded into small charging boxes that are picked up by a charging machine and emptied into the furnace. It takes from 75 to 100 boxes to supply enough scrap for one melt. Fuel costs are much greater for electric furnaces than for open hearths . . .



... But top-chargers and greater energy input from larger transformers are enabling electricians to offset the differential in fuel charges. So, today many producers are converting furnaces to top-chargers (McLouth Steel Corp., Trenton, Mich., is one). The top assembly can be pivoted to swing off the furnace. Then the furnace can be charged from specially built charging buckets operating on the clam principle

McQuaid, a Cleveland consultant on electricians, says: "If developments now underway to provide a lower cost-charge material are successful, there is a possibility that the position of the open hearth will be threatened in the not too distant future by the high powered modern arc furnace in all but a few large steelmaking centers."

A Matter of Money—The estimated investment (including the building) for an electric melt shop with two 70-ton furnaces is between \$2 million and \$2.5 million, if the facility is powered to produce about 20,000 tons of carbon steel ingots a month. An open-hearth shop to produce the same tonnage, with four 150-ton open-hearth furnaces, could be installed for a \$4.5 million-\$5 million investment.

Both power and electrode costs are somewhat higher for an electric furnace shop than liquid fuel costs for an open-hearth shop. Labor, refractory and other general operating costs are equal for both types of plants, given a similar annual capacity. Electricians provide a lower melting loss due to oxidation and a smaller plant carrying charge than required for the same capacity open-hearth plant. More auxiliary equipment is needed for electricians than open-hearths. Today, rimming steels of carbon grades can be made by electricians in quality equal to or better than the open-hearth product. Electricians cannot yet compete with large open hearths when blast furnace hot metal is used as part of the charge. But when medium-sized open hearths fired by liquid fuel use the cold melt process, electricians can definitely compete.

A Tale of Technology—The fourth factor behind the rise in electric steel capacity is technological change. A 70-ton electric furnace was once about as far as steelmakers could go. Northwestern Steel & Wire Co. is now building two 125-ton jobs at Ster-

ling, Ill. Sheffield plans two 90-ton units. Bethlehem Pacific Steel Corp. likewise has a 90-ton electric a-building at Los Angeles. Timken Roller Bearing Co. will eventually have three new 100-ton units at Canton, O.

One of the proponents of electric steel—they are an articulate and enthusiastic tribe—says: "Heretofore the electric furnace was considered a process for the production of high-cost quality steel only. First to accept it for commercial production was the tool steel industry, but as experience was gained and costs decreased, its field of application expanded. Electricians made possible production of stainless steels which had not been successfully produced by any other process. Current progress is being made in electrical equipment and controls, larger transformer capacity and improved operating practices."

Acids and Basics—Acid-lined furnaces are generally

ELECTRIC ARC FURNACE STEEL
(Ingots and Steel for Castings)

Annual Capacity as of Jan. 1		Net Tons	Annual Production as of Dec. 31	
1934	1,044,867		1934	404,651
1935	1,053,370		1935	606,471
1936	1,147,221		1936	865,150
1937	1,326,788		1937	947,002
1938	1,490,858		1938	565,627
1939	1,725,086		1939	1,029,067
1940	1,882,630		1940	1,700,006
1941	2,586,320		1941	2,869,256
1942	3,737,510		1942	3,874,540
1943	4,554,980		1943	4,589,070
1944	5,350,880		1944	4,237,699
1945	5,455,890		1945	3,456,704
1946	5,500,290		1946	2,563,024
1947	5,076,240		1947	3,787,735
1948	5,396,750		1948	5,057,141
1949	6,112,870		1949	3,782,717
1950	6,871,290		1950	6,039,008
1951	7,554,610			
1952	8,460,000*			
1953	9,900,000*			

*Estimated by STEEL
American Iron & Steel Institute figures

used for producing high-quality foundry steels and both gray and white irons. Some electric shops make steel and iron in alternate heats. In our country conditions favor the acid process for foundry operation because of availability of suitable low phosphorus and low sulphur scrap. But many basic lined units are producing plain carbon alloy and manganese steels.

On ingot practice, shops usually operate with a basic-lined furnace that permits efficient dephosphorization and desulphurization to low limits. In addition to plain carbon steels,

electrics are ideal for alloys such as tool and stainless steels and other products like Permalloy, nickel and its alloys, oxygen-free copper, etc. Special electric furnace equipment is used for producing ferroalloys.

A Lighter Scrap—Today, more light scrap—weighing approximately 40 to 50 pounds per cubic foot—is generated and available for melting down due to industry's tremendous use of sheet steel. Top-charged electric furnaces can be completely filled and the charge melted down more rapidly because the fluffier type scrap presents a much larger sur-

face area to absorb radiant energy from the arcs. As a result, larger transformers (up to 25,500 kva) are today being used that can pour energy into the furnace three or four times faster than of old. Net result is more tons of finished steel per hour.

On the research front, considerable study of arc furnace electrical characteristics is being made by the American Iron & Steel Institute's committee on electric furnace steelmaking. They are delving into investigations of transformer size and voltage in relation to furnace size, optimum current control, and measurement of electrical resistance. Investigations into induction stirring of the bath may prove of practical value to all electric steel producers. Advantages claimed are less time under final slag and material reduction of oxygen and sulphur resulting in fewer nonmetallic inclusions finding their way into the finished steel. One industry authority believes that induction stirring could lessen stratification and segregation in some high alloy and stainless steel heats. While it can be an expensive proposition for the steelmakers, many believe the technique will gain some degree of acceptance in the near future.

Dust Difficulties — Investigations are also being carried out concerning dust removal for the furnace. Various methods have been studied; some engineers believe that negative pressure on the furnace dome offers the greatest possibility. Only serious drawback seems to be that the remedy burns away the electrodes quite rapidly—and, in turn, skyrockets steel production costs.

You won't be able to go out and build an electric steel plant in the backyard to supply metal for your job stamping shop. But the process does give a flexibility to steelmaking, both technically and physically. Its greatest boon now is that it offers relief from the steel shortage, particularly to areas remote from the big steelmaking centers and to those larger steel users who want to make the metal themselves.

Tube Selection Aid Offered

Assistance in solving problems involving the use of alternate grades of low carbon, or carburizing grades of tubing steels, is offered in a new four-page bulletin published by the Babcock & Wilcox Tube Co. Known as bulletin TDC 149, it presents condensed data on microstructure, critical points, effect of alloy elements, forging, machining, welding and thermal treatment for 14 well-known alloy steels used in the production of tubular parts. Copies are available free on request to the company's offices.

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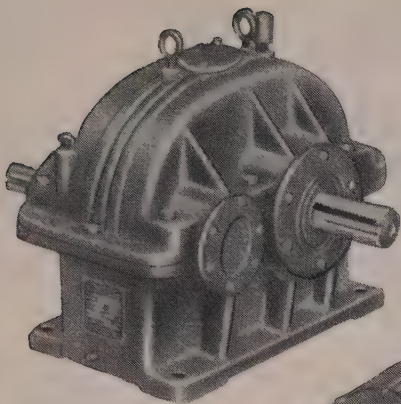
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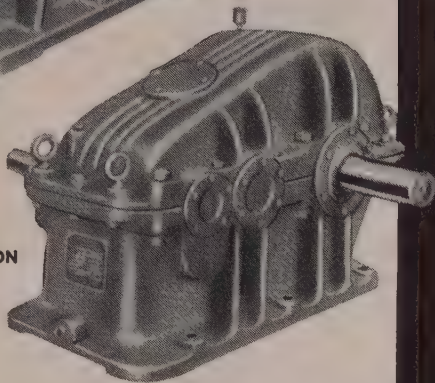
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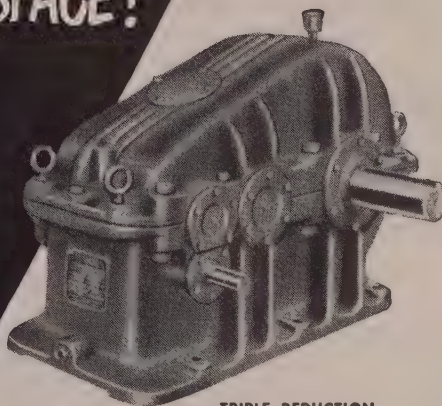


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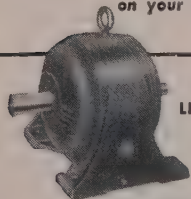
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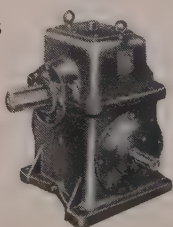
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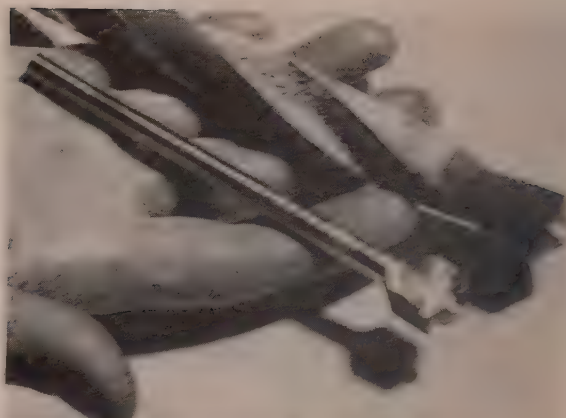
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Standard carbide tipped drill and fluteless drill before test run in melamine resin, fiber glass Micarta. Note notches in carbide cutting lip of fluteless drill



Standard carbide tipped and fluteless drills after comparative test. Loading of flutes not begun. Discoloration indicates excessive heating

Fluteless Drill Cuts Plastics Faster

By R. DOUBLE

Westinghouse Electric Corp.
Pittsburgh

DRILLING speed up to 900 surface-feet-per-minute through plastics with little heating or abrasion is possible with a new fluteless drill developed by the headquarters manufacturing engineering laboratory of Westinghouse Electric Corp. High speed steel drills have a short life because of heating and abrasion in the machining of all types of plastics. Heating is caused by flute loading—rapid wear by the high abrasive action of plastic materials, especially those with melamine resin or mineral fillers.

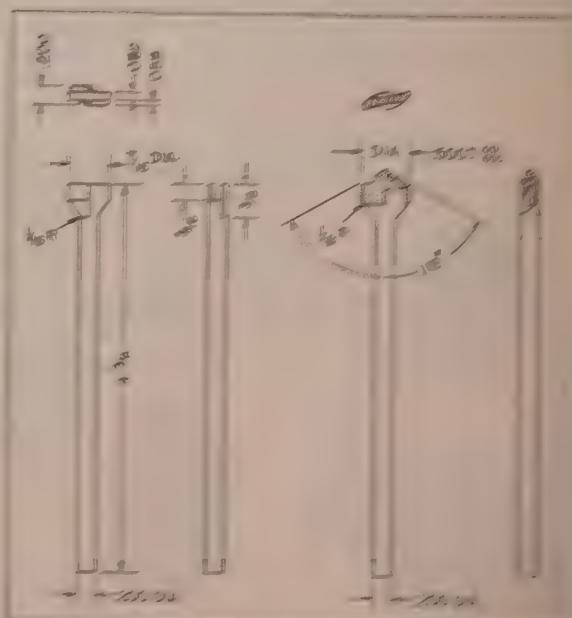
Faster Speeds.—Development of the drill was an accident. To lengthen drill life between grinds, many drill firms had experimented with carbide-tipped drills. This was a step in the right direction because such a drill withstood abrasion well and allowed increased operating speeds. But the problem of excessive drill heating caused by flute loading remained, as did the necessity of frequently withdrawing the drill for chip cleaning.

Because Westinghouse manufactures, supplies, and fabricates plastics, the laboratory began its own development work on carbide-tipped drills, but went a step further—it eliminated the flutes. Carbide twist-drill tips were brazed into round tool-steel shanks of various diameters below actual drill size. It was found that a twist drill tip, brazed in a carbon steel drill shank that is 40 per cent of the actual drill diameter, is the most efficient in strength, chip disposal and cost. Drill bits made this way are practical for $\frac{3}{8}$ -inch diameter and all larger sizes.

Drill Cooled.—Another Westinghouse development, the "notched grind," is incorporated in the drill. The

notched grind circulates air around the drill tip. This circulation helps expel chips and keeps the drill cool. Time is saved because it isn't necessary to remove the drill for flute cleaning—chips are left behind—and the ease of penetration allows a very rapid feed. The faster a drill is fed through the plastic the less the tool wear, and the result is greater efficiency in tool life and productive capacity. At 1800 rpm, or 3300 rpm, a 12 16-inch fluteless drill can be shoved through the hardest and most abrasion-molded or laminated plastics as fast as a man can feed the drill.

The plastics already mentioned have been drilled to a depth of 3 to 6 drill diameters without drill retraction. Since the shank diameter of the drill is 40 per cent of the drill size, up to 12 16-inch diameter drills can be used in the average No. 2 size sensitive drill press without tying up larger machines.



Schematic diagram of fluteless drill

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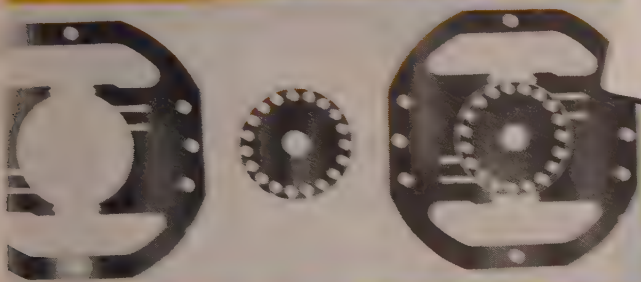
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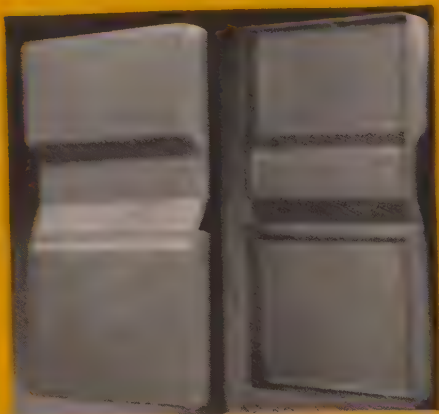
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Above, Johnson's Wax Lubricant used for lamination stamping increased sets per die from 45,000 to 55,000.

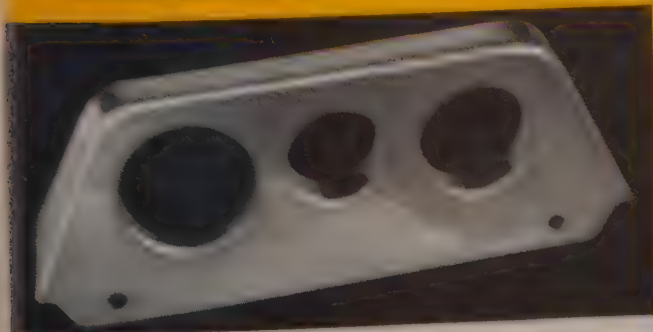
Right, Car radio case of hot rolled steel — impossible to draw with common lubricants — perfect consecutive draws with Johnson's Wax Lubricant.

Below, Telephone coin receptacle of No. 402 stainless steel drawn with Johnson's Wax Lubricant. No perceptible tool wear after thousands of successive perfect draws.



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Balling drum showing the movable leveling bar with cutters at about the 10 o'clock position. The bar keeps the surface of the ore relatively smooth and at a definite thickness which eliminates production of irregular lumps and large misshapen balls

Progress Revealed in PELLETIZING MAGNETIC TACONITE CONCENTRATE

When it became evident that agglomeration of enormous amounts of fine iron ore would be necessary if the taconites were to become an important source of iron ore for our steel industry, a resurvey of the various known methods was undertaken. While several processes were studied, this article concerns only the development of a pelletizing process as it grew out of an investigation of a 40-year old briquetting process

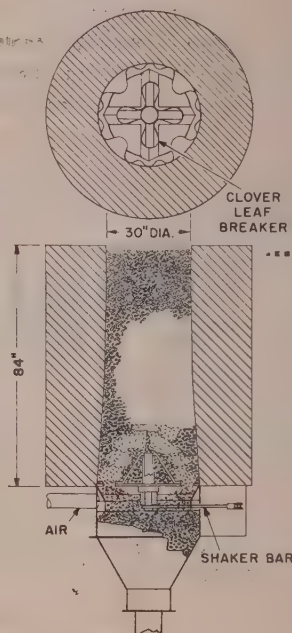
By E. W. DAVIS

Director

and
H. H. WADE

Assistant Director

Mines Experiment Station
University of Minnesota
Institute of Technology



Internal combustion-type pelletizing furnace used in the experiments. It is essentially a 7-foot brick-lined cylindrical shaft which is kept filled with pellets by feeding at the top

IN the pelletizing process, as in the Grondal briquetting procedure used during 1911, there are two basic steps: Molding damp ore into compacts and heating them to a high temperature. The first attempt to make taconite compacts by a continuous process was by use of an extrusion method. The product could be fired to produce good, substantial agglomerates but the equipment was awkward to operate; later a single screw, auger-type extrusion press was secured. Power taken by the auger was high, and wear on the screw and die was severe unless the concentrate was wetter than was desired for pelletizing.

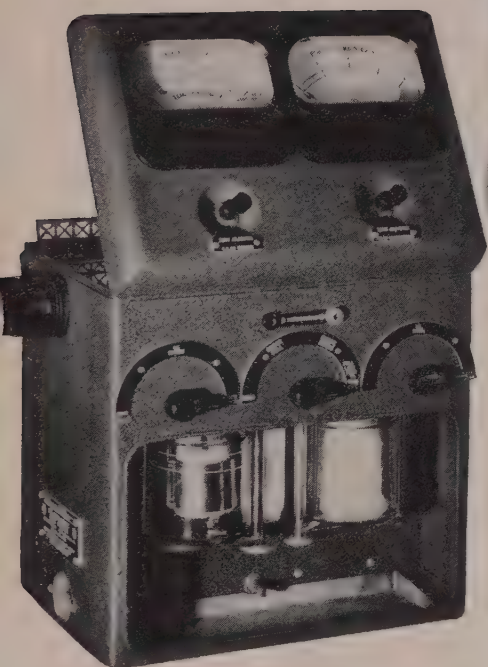
A number of schemes were investigated by the Mines Experiment Station at the University of Minnesota's Institute of Technology for making extrusions including a vibration method that, for a while, seemed to offer some promise, but eventually, it was decided to concentrate attention on developments of the balling process which appears to have been originally investigated in the agglomerating field by H. J. Stehli and John E. Greenawalt some 30 years ago.

Balling Procedure—Many small tests were made before our larger balling drum was installed. This drum was 3 feet in diameter and 6 feet long. It could be rotated at various speeds and the slope could be adjusted. Equipment was so arranged that the damp taconite concentrate could be fed to the drum at the rate desired, and after passing through the drum, could be screened on a shaking screen having $\frac{3}{4}$ -inch openings. Undersize from this screen was returned to the drum's feed end as a circulating load and the

screen oversize constituted the finished balls. An 8 x 16-inch drum has a taconite concentrate capacity of 20 tons per hour.

Balls in proper condition for pelletizing should withstand at least a 2-foot drop to a wooden floor without breaking and with a minimum of flattening. Obviously, the larger the balls, the more difficult it is to make them strong enough to withstand this test. It is a simple matter to make strong balls 1 to 1½ inches in diameter, but above this size, they ordinarily will not withstand rough handling.

A good ball is so tightly compacted that it cannot be made much stronger, even in a high-pressure press. This may be illustrated by dropping a ball into water and then breaking it up below the surface. Little, if any, air will appear from the inside of the ball, thus indicating that it is composed almost entirely of ore



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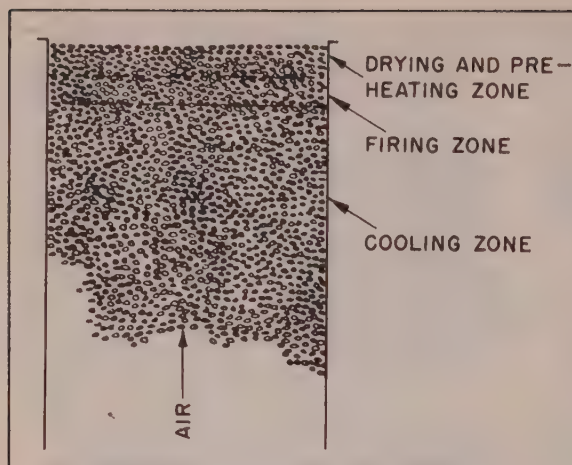
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Cross-section of the pelletizing furnace's stock column showing the three zones through which the compacts travel during the process

and water, neither of which can be compressed. If a harder ball is required, it must be made from drier ore or some binding material must be added as the ore is prepared for balling.

Tests Performed—In comparing balling characteristics of various ores, two tests of ball strength are frequently made—a compression test on the wet balls as produced by the balling drum, and a compression test on the dry balls. When balls enter the pelletizing furnace, the first thing that occurs is rapid and complete drying. Since dry balls must support a superimposed weight of new feed, their strength is important. Wet and dry strength of balls made from different magnetite ores ground to various sizes is shown in the accompanying table. Ordinarily, these tests are made on a 200-ball sample selected at random, half of which are dried before testing. Figures in the table show the weight in pounds that caused the balls to break, and average strength of the 100-ball sample, 10 strongest, and 10 weakest balls. Satisfactory furnace operation is ordinarily secured if the wet strength of the 10 weakest balls exceeds 2 pounds and the dry strength of the 10 weakest balls exceeds a pound and a half. At temperatures above 212° F the balls become stronger, and so, if they pass the dry strength test, will usually make good pellets.

Firing of the green compacts is fundamentally a very simple operation. Regardless of the compact's shape or size, it is only necessary to heat it to a high temperature—usually about 2300° F—in an oxidizing atmosphere in order to harden it. This heating can be done in any manner desired, perhaps the simplest laboratory method being to use an ordinary muffle furnace. Since the green compacts will contain several per cent of water when put into the furnace, it may be necessary with some materials to place them in the furnace's mouth for a few minutes before moving them into the higher temperature zones. Time required to harden compacts at the elevated temperature is usually only a few minutes after the whole compact has reached its top temperature. For test purposes, 20 minutes is usually considered ample.

The hot compacts may then be removed from the furnace and cooled. However, they should not be quenched in water or they become brittle.

Furnace Description—The new furnace that was constructed for this type of pelletizing is shown on p. 82. It was simply a brick-lined, cylindrical shaft 7 feet high and 3 feet inside diameter. Air inlets were provided at the bottom and, below this, a circular hopper constricted the discharge of the furnace to an 8-inch diameter pipe several feet in length. At the bottom of this pipe a scrapper-type discharge mechanism was installed with variable speed and stroke. This furnace was kept filled with pellets, and as new feed entered at the top, discharge at the bottom of the seal pipe would remove pellets at such a rate as to maintain the top level of the charge at a definite elevation. The idea was to establish a burning zone at some point near the top of the column, and then, by blowing air into the bottom of the shaft, cause this burning zone to move upward. As this zone moved upward, the column of pellets would be lowered by use of the feeder, and by this means, the burning zone could be maintained at about the same elevation.

To begin with, the fuel required to supplement the heat produced by the oxidation of magnetite was added as natural gas with the air entering the furnace bottom. After many trials, it was found possible to operate on magnetite balls and natural gas, but it was discovered that operations were simpler if coal was mixed with the taconite concentrate when the balls were formed. If sufficient coal was added when the balls were formed, no natural gas or other fuel was necessary. Fuel added to the ore when the balls are made amounts to about 30 pounds of powdered anthracite per ton when pelletizing magnetic taconite concentrate, but if hematite is being agglomerated, about twice that much fuel is required.

In operation of our furnace, we found that to make hard, strong pellets it was necessary to raise temperatures to very near the fusion point. When this was done, some clusters of pellets and even clinkers were formed which could not be discharged through furnace bottom. An oscillating grate mechanism was installed at the bottom of the brick selection to break up these clusters and clinkers. This grate is actuated by a timing mechanism that causes it to turn through a small angle every few minutes. It has been quite

MAGNETITE BALLS
COMPRESSION STRENGTH IN POUNDS

Ore	Wet Balls			Dry Balls		
	Average	Strongest	Weakest	Average	Strongest	Weakest
	10	10	10	10	10	10
A	2.35	2.79	2.01	0.575	0.750	0.500
AA (2# Starch)	2.53	2.92	2.20	8.45	9.90	7.45
B	3.52	4.00	2.98	1.75	1.99	1.51
C	3.19	3.48	2.60	1.15	1.32	1.00
D	4.16	4.74	3.69	2.88	3.30	2.51
E	4.44	6.10	3.10	7.06	8.60	4.21
F	3.55	4.00	3.04	3.70	4.07	3.17
FF (1½# Starch)	3.34	3.91	2.87	6.53	7.31	5.68
G	5.00	5.65	4.50	5.30	6.23	4.42
H	2.60	3.06	2.23	2.02	2.46	1.60
HH (4# Bentonite)	3.22	3.82	2.71	5.47	6.11	4.84
HHH (2# Starch)	2.67	3.15	2.29	5.42	6.22	4.80
I	4.57	5.09	3.89	4.91	5.48	4.39
J	3.62	4.87	2.71	2.29	3.39	1.35
JJ (5# Sodium Sil.)	3.86	5.29	3.07	5.18	7.10	3.54

AA—Same as A with 2 lbs./ton of starch added.
FF—Same as F with 1½ lbs./ton of starch added.
HH—Same as H with 4 lbs./ton of Bentonite added.
HHH—Same as H with 2 lbs./ton of starch added.
JJ—Same as J with 5 lbs./ton of sodium silicate added.

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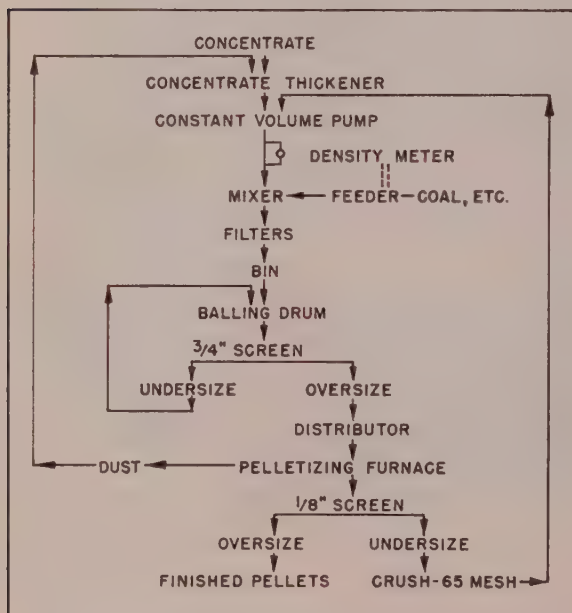
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effective in breaking up large masses of pellets so that movement through the seal pipe and discharge feeder is made easier. However, development of methods for discharging large masses of pellets that have become fused together is still a serious problem in larger furnaces and is receiving much attention at the present time.

Three Stock Column Zones—In order to facilitate discussion of the process of pelletizing magnetic taconite, the furnace stock column may be considered as being divided into three zones as shown on p. 84. From the top of the stock down, these are: Drying and preheating zone, firing zone, and cooling zone. It makes little difference whether fuel is added to the ore mix, introduced into combustion chambers, or mixed with the air blown into the bottom of the shaft, the above three zones exist in a properly operating furnace and are similar in nature, extent, and location in the shaft.

Of these three, the cooling zone is, by far, the deepest. This is where the balls, as they move downward, continually get colder and the air, as it moves upward, continually gets warmer. The drying and preheating zone at the top of the column is much shorter than the cooling zone and it is here that the balls get warmer as they move downward and the gases get cooler as they move upward. The firing zone is a comparatively narrow zone between the other two in which both the balls and gases reach maximum temperatures. In this zone, magnetite burns to hematite; the more rapid and complete the burning, the higher the peak temperature that is reached. From this, it is apparent that the preheating zone is the area in which the gases are warmer than the ore. In the cooling zone, the ore is warmer than the gas, and in the firing zone, the ore and gas are at about the same temperature.

The balls are wet when they enter the furnace.



Flow sheet of the pelletizing process

Their water content must be vaporized and carried away with the exit gases; this is the only large, heat-consuming operation in the process. Taconite balls contain about 10 per cent water and the heat required to vaporize this water amounts to about 250,000 Btu per ton of furnace charge, depending somewhat upon temperature of the furnace exit gases. Since the magnetite concentrate, in oxidizing to hematite, liberates in excess of 250,000 Btu per ton, there would be sufficient heat produced by this oxidation to complete the pelletizing operation if there were no heat losses.

Balls Must Be Fed Properly—Next in importance in making good balls is feeding them properly into the pelletizing furnace. If all of the balls were of exactly the same size, and were strong and substantial, and if there were no breakage in handling, feeding would be a comparatively simple operation, but unfortunately, this is seldom the case. Taconite balls made in the ordinary manner will vary in size by as much as a half a diameter; i.e., if the balls are oversize of a one-half inch screen, top size may be about $\frac{3}{4}$ -inch, which is a difference of nearly three and a half times in volume and weight.

Various feeding methods have been and are still being experimented with, but the most satisfactory method that has been found for our furnace is to move the head pulley of the conveyor from which the balls are fed, around over the top of the charge in a definite pattern. If any low points develop, they are filled up immediately, but balls are not allowed to roll into low spots. This method of feeding has the advantage of distributing the breakage and fines uniformly throughout the furnace.

In general, the rate at which air is blown into the pelletizing furnace determines the rate at which the firing zone moves upward through the charge and this in turn determines furnace capacity per unit of cross-section area. When the furnace is blown at the rate of about 80 to 100 cubic feet of air per minute per square foot of cross-section area, the firing zone moves upward at the rate of one-half to one inch per minute. Under these conditions the furnace has a capacity of from 4 to 5 tons of dry feed per day per square foot of cross-section area.

Pellets Have Large Surface Area—Taconite pellets contain about 30 per cent voids and, therefore, present a large surface for fast heat interchange and for rapid reduction. The pellets are high in iron and proportionately low in silica and phosphorus. They contain practically no titanium or sulphur or other objectionable impurities. They weigh about 125 pounds per cubic foot and have an apparent specific gravity of about 3.3. After being submerged in water, they contain about 9 per cent moisture, but after draining for 24 hours, moisture drops to about 5 per cent.

Several testing methods are in use to measure pellet quality but the most satisfying one is a drop test. Our pellets are screened at 14 mesh and a 50-pound sample of the oversize is dropped 3 to 6 times through a distance of 33 feet into a steel box. The product is then screened to determine the effect of this treatment. The best pellets do not produce more

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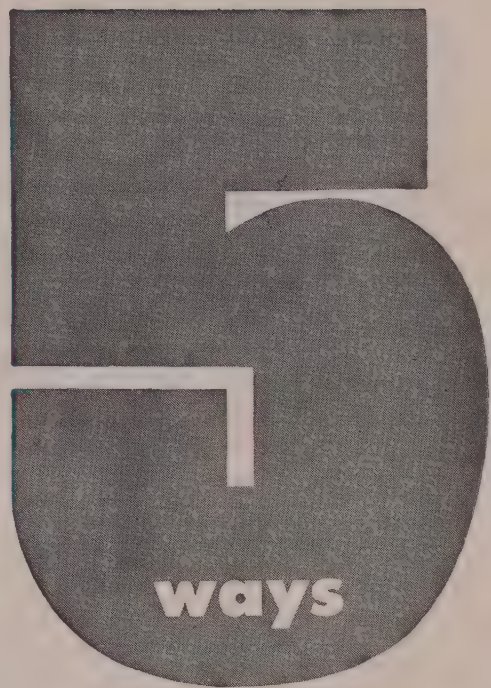
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than 10 per cent of -14 mesh material after three drops.

While the first furnace we developed was of the combustion-chamber type, much more work has been done during the past few years on the internal combustion furnace. While this type appears to be much cheaper to construct and operate than the combustion-chamber type, it has the disadvantage of lacking quick and positive temperature control. This is more apparent than real, however, because of the necessity for making pellets as strong as possible to resist breakage in shipment. This means operating the furnace at or very near the fusion temperature. There is no objection to this if it is equipped to discharge fused pellets; such equipment is now quite generally accepted as being desirable. With a furnace equipped to discharge fused pellets, the necessity for quick and accurate temperature control becomes less important and the internal combustion method in which the supplementary fuel is mixed with the ore before it enters the furnace becomes more interesting. This mixing and proportioning, however, must be carefully planned.

Little Variance in Carbon Content—When it is considered that 28 pounds of coal must be mixed so thoroughly with 2240 pounds of ore that each of the 75 thousand balls made from it will contain one-sixth of a gram of carbon, this blending operation looks difficult. However, it has not been found to be difficult, since the mixing may be done in the slurry form before the ore is filtered. Many tests have been made in which 25 balls have been selected at random from the furnace feed belt and each ball analyzed for carbon. Typical results show the average of all 25 balls to be 1.12 per cent carbon, with the highest analysis being 1.20 per cent and the lowest 1.09 per cent. Maintaining the desired proportion is more difficult than mixing because of changing rates of pulp flow and of per cent solids in the pulp. This has been well worked out, however, by pumping a constant volume of the pulp to the mixer and then controlling the coal fed to it by the density of the pulp.

Actually, when making hard pellets, maintaining the carbon content of the balls within 10 per cent of the desired analysis is all that is required. Thorough mixing of the coal is more important than having exactly the right amount but maintaining uniform porosity in the stock column is most important of all.

Pelletizing Requirements Listed—The most important requirements for

pelletizing using the internal combustion furnace are: Mix coal thoroughly, make good, clean balls, feed them to the furnace in such a manner that there is absolutely no segregation, and equip the bottom of the furnace with adequate clinker breakers. This furnace can be used to pelletize all types of iron ore except those in which ball shrinkage in the preheating zone is so great as to make them impervious to furnace gases. No such ore has been tested but this effect has been observed when too much sodium silicate has been added to the balling mixture.

In pelletizing with the combustion-chamber type furnace, the most important requirements are: Make good, clean balls, feed them to the furnace in such a manner that there is absolutely no segregation, design the furnace so that there are no restrictions that will impede the downward movement of the charge, even if it is clinkered solid, and equip the bottom of the furnace with adequate clinker breakers. This furnace can be used to pelletize all types of iron ore provided that the combustion chambers are designed to operate with exit gas temperatures as high as 2400° F. If the balls contain sufficient combustible materials such as magnetite, the combustion chamber temperature can be reduced to 1850° F but the higher temperature is required for pelletizing hematite.

A combination-type furnace equipped to operate simultaneously with combustion chambers and fuel additives is now receiving very careful attention. The main idea is that this type may develop some special advantage that will, to some extent, obviate the necessity for maintaining uniform porosity in the stock column and, at the same time, make carbon control less sensitive. This furnace can be used to pelletize any type of iron ore. However, if the balls, for any reason, are impervious to the furnace gases, the combustion chambers would have to operate at a very high temperature.

Valve Catalog Revised

Logansport Machine Co., Logansport, Ind., announces revisions in its air control valve catalog 100-4. These revisions effect only those pages covering light-duty 2-position 4-way valves, 2 and 3-way valves and poppet-type hand control valves.

The revised pages provide engineering data, information, illustrations and dimensional drawing on additional valve models plus changes in model numbers. This literature is now available on request.

CALENDAR OF MEETINGS

† Denotes first listing in this column.

August 20-23, American Institute of Electrical Engineers: Pacific general meeting, Multnomah Hotel, Portland, Oreg. Institute address: 33 W. 39th St., New York 18.

August 20-23, National Association of Power Engineers Inc.: Annual meeting and exhibit, Hotel Plaza, San Antonio, Tex. Association address: 176 W. Adams St., Chicago 3.

September 3-7, American Chemical Society: Annual meeting, Hotel Statler, Washington. Society address: 1155 16th St. NW, Washington 6.

September 4-6, Liquefied Petroleum Gas Association: Pacific Coast convention, Fairmont Hotel, San Francisco. Association address: 11 S. La Salle St., Chicago 3.

September 5-7, American Hot Dip Galvanizers Association Inc.: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Association address: 2311 First National Bank Bldg., Pittsburgh.

September 6-7, Rail Steel Bar Association: Semi-annual meeting, The Broadmoor, Colorado Springs, Colo. Association address: 38 S. Dearborn St., Chicago.

September 8-9, New York; September 14-15, Washington, International Union of Pure and Applied Chemistry: Annual meeting.

September 10-13, International Congress of Pure and Applied Chemistry: Annual meeting, New York.

September 10-14, International Foundry Congress: Brussels. Congress address: General secretary, Foundry Congress, c/o Fabrimetal, 17 Drapiers St., Brussels.

September 10-14, Instrument Society of America: National instrument conference & exhibit, Sam Houston Coliseum, Houston. Society address: 921 Ridge St., Pittsburgh 12.

September 10-15, Annual Industrial Engineering Conference: Mechanical Dept., Industrial Engineering Division, Michigan State College, E. Lansing, Mich.

September 11-13, Society of Automotive Engineers: Tractor meeting, Hotel Schroeder, Milwaukee. Society address: 29 W. 39th St., New York.

September 14-16, American Society of Sanitary Engineering: National convention, Hotel Statler, Detroit. Society address: 1308 Freemont St., McKeesport, Pa.

September 17-19, Allied Railway Supply Association: Fall meeting and exhibit, Hotel Sherman, Chicago. Association address: Box 5522, Chicago 80.

September 21-23, National Association of Waste Material Dealers Inc.: Fall meeting, Saranac Inn, Upper Saranac Lake, N. Y. Association address: 1109 Times Bldg., New York 18.

September 24-25, Steel Founders Society of America: Fall meeting, The Homestead, Hot Springs, Va. Society address: 920 Midland Bldg., Cleveland 20.

September 24-25, American Coke & Coal Chemicals Association: Annual meeting, Skytop Lodge, Skytop, Pa. Institute address: 711 14th St. NW, Washington.

September 24-26, National Truck Body Mfrs. & Distributors Association: Annual convention and suppliers exhibit, Haddon Hall, Atlantic City, N. J. Association address: 346 Connecticut Ave. NW, Washington.

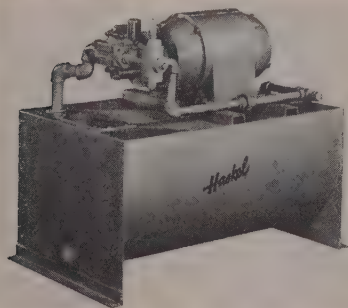
September 25-28, American Society of Mechanical Engineers: Fall meeting, Hotel Radisson, Minneapolis. Society address: 29 W. 39th St., New York.

†September 26-29, Marking Device Association: National convention, Edgewater Beach Hotel, Chicago. Association address: 134 N. La Salle St., Chicago.

New Products and Equipment

Hydraulic Power Units

Hydraulic power units, combining reservoir, pump and motor into a compact package is announced by Haskel Engineering & Supply Co., 721 W. Broadway, Glendale 4, Calif. The line contains 224 standard models in three basic standard series: 1. Low-pressure units which supply up to 1750 psi pressure and range from 1½ to 50 gallons per minute in single pump models or to 100 gpm in double pump models; 2. high-low units that provide a dual pressure source by combining a high pressure and low pressure pump with automatic unloading of the low pressure pump; 3. high-pressure units, supplying to



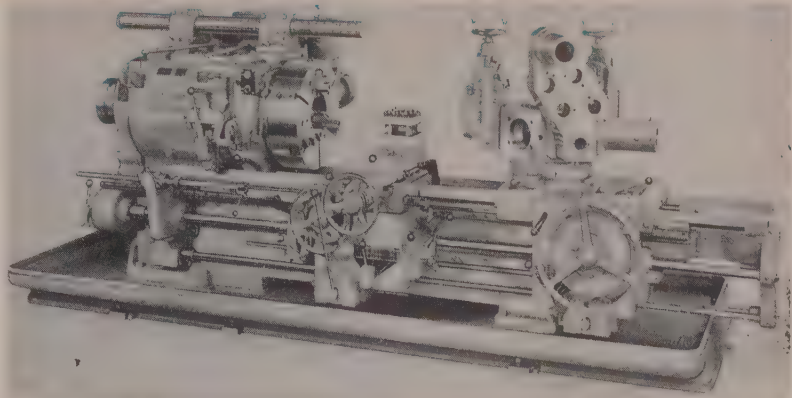
10,000 psi pressure and ranging from 1½ to 5 gpm in single pump models and to 10 gpm in double pump models.

Low-pressure and high-low units feature cylindrical reservoir bottoms for maximum usage of oil, visible oil level indicator plugs and adjustable pressure relief valves. The power units are available for either stationary installation or for use as a portable unit with two swivel and two fixed heavy duty synthetic rubber tread casters and provisions for towing.

Check No. 1 on Reply Card for more Details

Turret Lathes Redesigned

Hydraulically actuated forward and reverse clutch in combination with a disk-type hydraulic brake has been incorporated in the headstock of the model 4A heavy duty saddle type turret lathe made by Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, O., providing for faster and smoother handling of the 8 to 12-inch bars accommodated. Mechanism is controlled by a forward-reverse-brake lever which eliminates the neutral or intermediate delay position. The rapid traverse shaft has been moved to



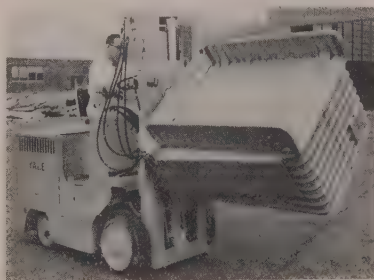
the front, and rapid traverse is provided to the cross slide with a single lever to control rapid traverse motion in four directions.

Power for the rapid traverse drive is supplied by a separate 3 hp motor mounted in back of the headstock. This motor also drives the coolant, hydraulic and lubricating pumps. Pressure in the lubricating system is increased, and a pressure gear pump is applied to the unit. All electrical controls are consolidated in a single box, simplifying protection and maintenance. Bar feed attachment for the 4A model is hydraulically operated. The power chuck wrench control lever is replaced by a pistol grip arrangement, using a trigger interlock release for easier manipulation.

Check No. 2 on Reply Card for more Details

Load Centered Automatically

Hydraulically operated clamp for industrial fork trucks, which enables bales, bins, drums, and miscellaneous



containers to be picked and transported on the centerline of the truck is a development of Philadelphia Division, Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa. This clamp eliminates instability

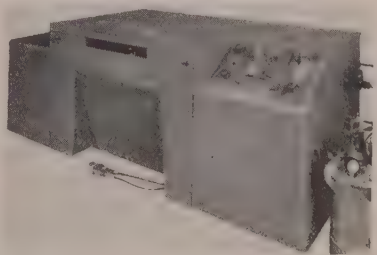
caused by off-center loading, particularly when clamp and load are rotated.

When used with a rotator, the clamp does not creep off center. Loss of pressure grip in arms is minimized. A variable clamping pressure permits handling of any type load, from fragile cartons to heavy containers. Arms have an inside opening range from 17 to 66 inches. Clamp will handle loads up to 6000 pounds, and can be installed on gasoline or electric trucks.

Check No. 3 on Reply Card for more Details

Production Spray Painter

An automatic air-operated spray painting machine with hydraulic control that permits the painting of a



variety of small parts on a mass production basis, is a development of Conforming Matrix Corp., 345 Toledo Factories Bldg., Toledo, O. Parts can be wet painted, one color right after another. Spraying is from underneath against the masks minimizing cleaning. Surplus spray falls away, is sucked off and exhausted out of the back of the machine. Electro-formed metal masks fit flush with the table and parts are loaded manually by the operator. The spraying is automatic but the length of spray time and the speed of the loading

cycle are controlled by dials upon the control panel. Production rates up to 3600 pieces per hour are possible.

A conveyor belt, which can flow across the rear of the table, brings work to the operator and carries it away, freeing both hands for loading. The machine employs latest type guns and has air agitated paint pressure tanks. All working parts are automatically oiled and controls are grouped on a panel.

Check No. 4 on Reply Card for more Details

Works in Small Areas

A heavy duty high speed electric fork truck designed for warehouse operations where minimum operating space is one of the prime requirements is announced by Lewis-Shepard Products Inc., 195 Walnut St., Watertown 72, Mass. Spacemaster 61



will carry and high stack loads up to 3000 pounds and 48 inches long. It is also capable of picking up and transporting loads up to 4000 pounds and 32 inches long. Pallets 40 inches long can be right angle stacked in a 10-foot aisle.

Mast design provides 127 inches of fork elevation and 65 1/4 inches free lift with 83-inch collapsed height. Hydraulic pump and pump motor are located directly beneath the operator's corridor and can be easily reached for service work. All vital parts can be inspected or serviced from top side of truck. Design of the truck eliminates the need for periodic lubrication.

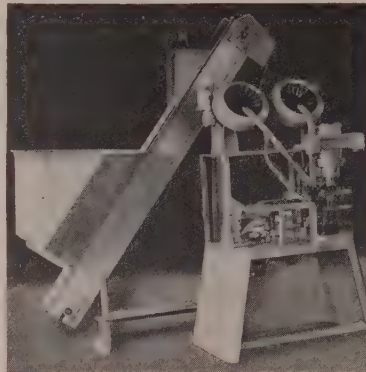
Check No. 5 on Reply Card for more Details

Clutch Plate Assembler

Klass Machine & Mfg. Co., 4328 E. 49th St., Cleveland 25, O., has designed a machine to place springs in clutch plate cavities. Separate hoppers contain the rivets which hold the spring in the cavity and the springs

themselves. Two rivets are automatically fed to the spring where one rivet is placed in each end of the spring. The spring is dropped from a separate hopper to make the assembly cycle completely automatic.

The assembled springs and two rivets are forced into the cavity by a hy-



draulic press. An air-operated indexing fixture rotates the clutch plate each time a cavity is filled with the spring-rivet assembly. The machine can be adapted to assembly of any size clutch plate with varying requirements as to the number of spring assemblies needed. Conveyors can be supplied to carry the parts from the bins to the separate hoppers and also to keep the hoppers filled automatically.

Check No. 6 on Reply Card for more Details

Machine Welds and Solders

Joyal Products Inc., 56 Belmont Ave., Newark, N. J., announces a resistance spot welding and soldering machine equipped with timer. It silver solders, soft solders and spot welds precious and dissimilar metals;



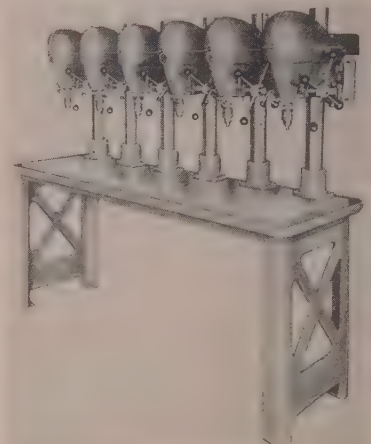
spot welds steel parts up to 3/32-inch thick; solders brass up to 1/8-inch thick as well as sterling silver and other precious metals. Collars determine control pressure to protect parts soldered from excessive heat that would cause marking.

Model 1000 WV operates on 110 v ac at 9 amps and model 2000 WV operates at 220 v ac at 10 amps. The latter model is equipped with water-cooled electrode holders. The electrode operation is spring-action controlled so that, when electrode arms are closed, work is held firmly in position during soldering and cooling. An automatic cutoff timer regulates soldering time and heat control with 11 adjustments determines correct heat for the job. When dials are set uniform soldering time, heat and holding pressure on the electrodes are maintained, regardless of how long the foot switch is held down.

Check No. 7 on Reply Card for more Details

Multiple Spindle Drill

Toolkraft Corp., Springfield, Mass. announces a line of heavy duty, production model, industrial multiple spindle drill presses. Standard 15-inch models are available with one to



six heads mounted on large table with cast iron legs.

Features included in the Darra-James drill presses are: Self-aligning grease sealed ball bearings, double hinged guard, lifts from front to rear, free floating six spline spindle and streamlined design.

Check No. 8 on Reply Card for more Details

Faster Metal Disintegrators

Electronic control without tubes and faster cutting speeds are features of the metal disintegrators made by Electro Arc Mfg. Co., 5930 Commonwealth Ave., Detroit, Mich. Electrical current to operating head is rectified to direct current and head is so constructed that contact is made 60 times a second at alternating current peak of positive half of sine wave. Since maximum burning power can only be obtained at this peak, high cutting efficiency is assured.

"One always stands out"



and among refractory dolomites it's . . .

BAKER'S MAGDOLITE

**ALWAYS
5 WAYS BETTER**

- Composition
- Preparation
- Economy
- Strength
- Quality

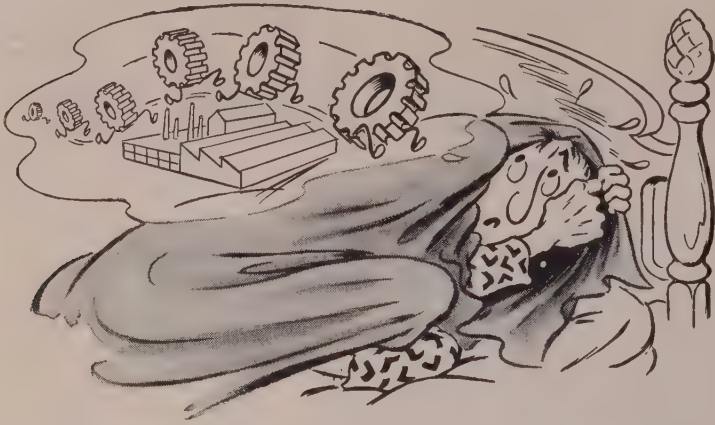
In these days of highly competitive, 100% of capacity production, it pays to use "both hands." And it pays to use **Baker's Magdolite**, the absolutely dependable refractory dolomite.

Magdolite's superior chemical, physical, and mineralogical composition assure you of minimum maintenance and repairs. When you buy . . . specify **Baker's Magdolite** . . . the logical choice in refractory dolomites.



THE J. E. BAKER COMPANY

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Why lose sleep counting scrap?

If you're worrying about profits (and how to produce them) you're also probably worrying about scrap (and how to eliminate it). Federal Gages *can* improve the control of dimensions throughout your manufacturing processes — the sure way to reduce scrap, waste, and rework . . . the sure way to increase profits.

How do we know it's the sure way?

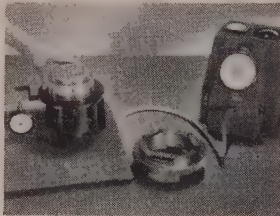
Because we've been building Gages for over 20 years. Because we've helped every type of manufacturing industry . . . and seen our Gages improve quality, reduce scrap, and increase output. Because we have over 20,000 individual gage designs in our engineering files — each representing an actual case where Federal Gages have been put to work PROFITABLY. Because we offer you the choice of the right gaging system (mechanical, air, electronic, electrical) correctly designed (on the basis of actual experience) to do your job in the best possible way (manually, semi-automatically, fully automatically).

Don't lose sleep over scrap. Put your dimensional control problems up to Federal. It's the wise thing to do. FEDERAL PRODUCTS CORPORATION, 1217 Eddy St., Providence 1, Rhode Island.

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DIMENSIONAL
CONTROL
IS ALWAYS IN
THE PICTURE



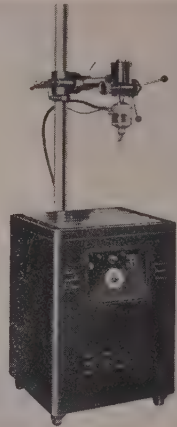
Continuous Measuring Gage checks thickness of hard board sheets . . . automatically marks defective areas.



Federal Dimensionair Air Gage (range .003", magnification 2500 to 1) used in combination with Dial Indicator.



Electronic Gage automatically sorts mica sheets into correct thickness categories.



utes; cut 3/16-inch hole through 3/32-inch deep hardened steel (62 Rockwell) in 10 seconds; disintegrate 1/2-20 tap to depth of 7/8 to 1 inch in 1 minute; and disintegrate 1/2-13 tap to depth of 1 1/2 inches in 4 2/3 minutes.

Check No. 9 on Reply Card for more Details

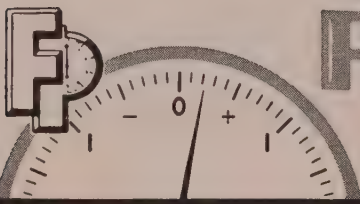
Multiple Drilling Jobs Handled

A three-way 20-spindle hydraulic speed drilling machine has been built by Le Maire Tool & Mfg. Co., 2657 S. Telegraph Rd., Dearborn, Mich. It consists of a fabricated steel center



base which carries trunnion support with No. 200 twin ram vertical single spindle units with No. 30 HS horizontal right hand and left hand units. The right hand unit has a nine spindle head and the left hand unit has a ten spindle head.

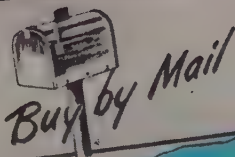
The No. 30 HS units have hardened and ground steel ways with a distance of 30 inches across the ways. The ten-position trunnion is hydraulically operated for automatic indexing and carries ten work holding fix-



FEDERAL

Largest manufacturer devoted exclusively to designing and manufacturing all types of DIMENSIONAL INDICATING GAGES.

Udylite



Price Guide No. 1

IF IT'S TO BE HAD—WE HAVE IT!

Udylite's leading position in the metal finishing field, large volume operation, buying power and years of experience assure "If it's to be had—we have it!" And Udylite supplies are laboratory-tested for quality. This is vitally important under today's conditions of forced substitutions. Our nationwide sales staff welcomes any order—from one pound to a carload lot. As an added service, Udylite distributes each month a six-page buying guide listing supply prices which are checked and reissued monthly and essential market data with a forecast based on latest information. If you would like to receive this valuable service write today giving your complete address. There's no obligation.

Sulphuric Acid 66% 200#		Sulphuric Acid 66% 200#		Sulphuric Acid 66% 200#	
1 carboy		1 carboy		1 carboy	
10 carboy		10 carboy		10 carboy	
25 carboy		25 carboy		25 carboy	
AMMONIUM HYDROXIDE		AMMONIUM HYDROXIDE		AMMONIUM HYDROXIDE	
12 gal carboys 100#		12 gal carboys 100#		12 gal carboys 100#	
Carboys Returnable		Carboys Returnable		Carboys Returnable	
AMMONIUM NITRATE		AMMONIUM NITRATE		AMMONIUM NITRATE	
5 lbs		5 lbs		5 lbs	
10 lbs		10 lbs		10 lbs	
25 lbs		25 lbs		25 lbs	
50 lbs		50 lbs		50 lbs	
100 lbs		100 lbs		100 lbs	
325 lb. bbl		325 lb. bbl		325 lb. bbl	
ANODES		ANODES		ANODES	
Brass Ball 22"		Brass Ball 22"		Brass Ball 22"	
100# drum		100# drum		100# drum	
100 lbs		100 lbs		100 lbs	
300 lbs		300 lbs		300 lbs	
400 lbs		400 lbs		400 lbs	
1000 lbs		1000 lbs		1000 lbs	
2000 lbs or more		2000 lbs or more		2000 lbs or more	
West Coast 3c lb. higher		West Coast 3c lb. higher		West Coast 3c lb. higher	
Cadmium See 12/24		Cadmium See 12/24		Cadmium See 12/24	
Copper Ball 20"		Copper Ball 20"		Copper Ball 20"	
100# drum		100# drum		100# drum	
100 lbs		100 lbs		100 lbs	
300 lbs		300 lbs		300 lbs	
400 lbs		400 lbs		400 lbs	
1000 lbs		1000 lbs		1000 lbs	
2000 lbs or more		2000 lbs or more		2000 lbs or more	
West Coast 3c lb. higher		West Coast 3c lb. higher		West Coast 3c lb. higher	
BURNISHING MATERIAL		BURNISHING MATERIAL		BURNISHING MATERIAL	
McDonald Compound		McDonald Compound		McDonald Compound	
Steel Barashine Balls		Steel Barashine Balls		Steel Barashine Balls	
BUFFS & POL. WHEELS		BUFFS & POL. WHEELS		BUFFS & POL. WHEELS	
Price on application		Price on application		Price on application	
BRUSHES—WHEEL AND HAND		BRUSHES—WHEEL AND HAND		BRUSHES—WHEEL AND HAND	
Price on application		Price on application		Price on application	
BUFFS & POL. WHEELS		BUFFS & POL. WHEELS		BUFFS & POL. WHEELS	
Price on application		Price on application		Price on application	
C. ACID		C. ACID		C. ACID	
Regular 100#		Regular 100#		Regular 100#	
50 lbs		50 lbs		50 lbs	
25 lbs		25 lbs		25 lbs	
100# or more		100# or more		100# or more	
200# or more		200# or more		200# or more	
500# or more		500# or more		500# or more	
1000# or more		1000# or more		1000# or more	
ALUMINUM		ALUMINUM		ALUMINUM	
45.75		45.75		45.75	
32.75		32.75		32.75	
22.5		22.5		22.5	
19.5		19.5		19.5	
14.5		14.5		14.5	
LIME		LIME		LIME	
6.00		6.00		6.00	
4.45		4.45		4.45	
PLASTIC BUFFS		PLASTIC BUFFS		PLASTIC BUFFS	
2.40		2.40		2.40	
1.00		1.00		1.00	
PUMICE		PUMICE		PUMICE	
2.40		2.40		2.40	
1.00		1.00		1.00	
POLICE—HAND ROLL		POLICE—HAND ROLL		POLICE—HAND ROLL	
2.40		2.40		2.40	
1.00		1.00		1.00	
PUMICE		PUMICE		PUMICE	
2.40		2.40		2.40	
1.00		1.00		1.00	

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CORPORATION
DETROIT 11, MICHIGAN



Unusually clean sockets in double-extrusion-produced Cleveland Socket Screws

You're sure of faster-working, extra clean sockets in Cleveland Socket Head Screws. Made by the Kaufman Double Extrusion Process in closely controlled progressive operations *in one machine*, (see above) sockets are perfectly concentric, true hex with sharp corners, and *clean*—all the way to the bottom. It pays you to specify and buy Cleveland Socket Head Screws.

THE CLEVELAND CAP SCREW COMPANY
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Warehouses: Chicago, Philadelphia, New York, Providence

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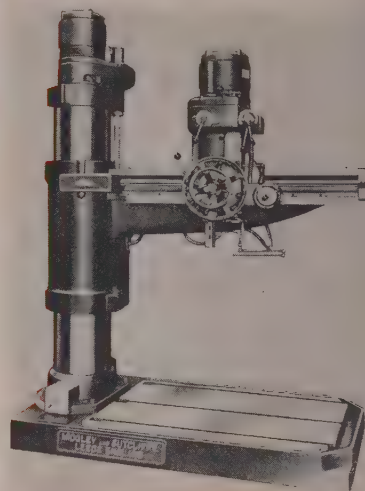


tures which are clamped in a clamp with a hydraulic torque wrench. Production is approximately 100 pieces per hour at 100 per cent efficiency.

Check No. 10 on Reply Card for more Details

Precision Radial Drilling

Richmond HB3 radial drilling machine, made in England by Midgley & Sutcliffe, is available through British Industries Corp., International Machinery Div., 164 Duane St., New York 13, N. Y. Fatigue and idle time



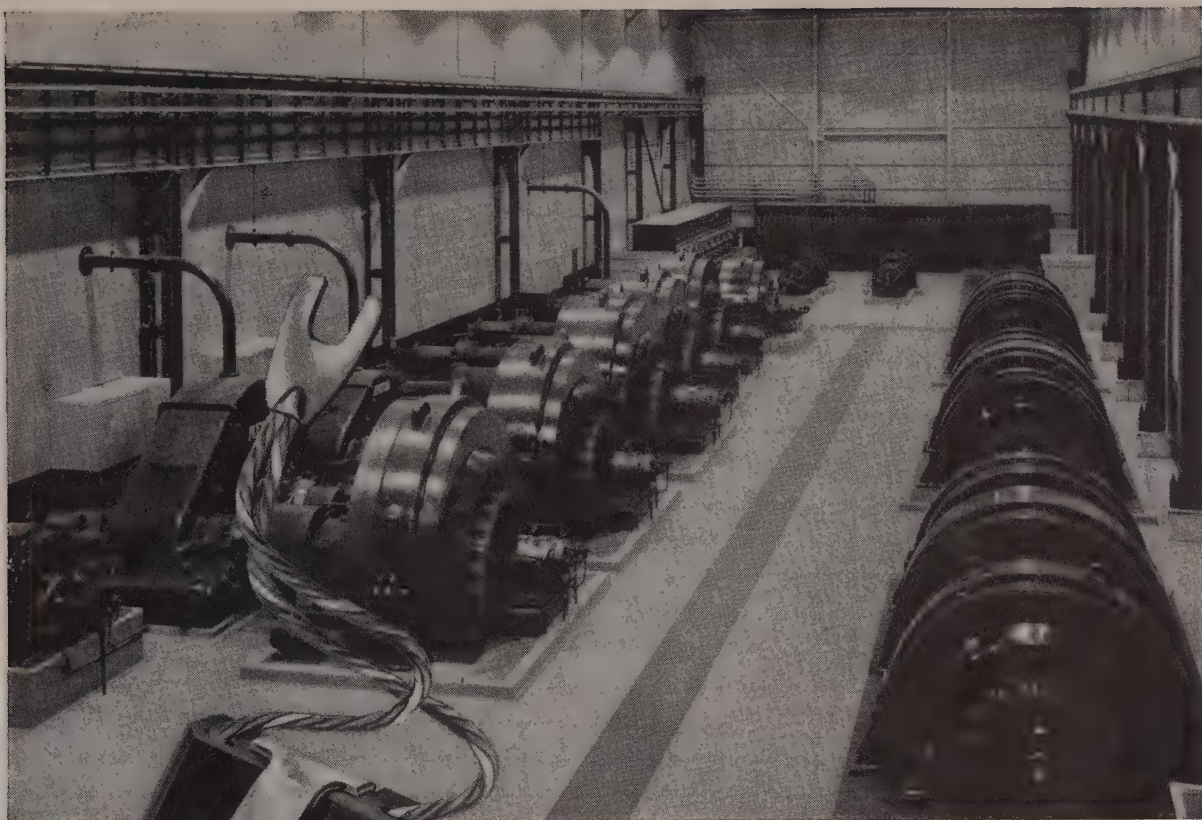
are reduced to a minimum by centralized levers. Separate motors provide drilling and elevating power, both motors being controlled by a single joy-stick type switch on saddle. Driving gears are made from chrome nickel steel and shafts are high carbon heat treated steel running in ball bearings. Sliding gears are mounted on six spline shafts.

A wide range of spindle speeds provides for tapping, boring and drilling in steel or alloys. Lubrication of saddle gears is positive and dependable by built-in pump. Electrical supply meets NEMA standards, 220 v 3 phase 60 cycle.

Check No. 11 on Reply Card for more Details

Foil and Screen Repair

A portable resistance spot welder is available from H. I. Thompson Co., 1733 Cordova St., Los Angeles 7, Calif., for on-the-job repair of Inconel and stainless steel foil and screen and for making alterations required by changes in design. Operation of the Hit-Kit is by trigger-type switch. Foil is securely welded in place by contacting both electrodes to the foil surface and inducing current by operating the trigger. Welder is equipped with leads 9 feet in



Courtesy of Carnegie Illinois Steel Corporation

KEEP PRODUCTION ROLLING WITH **SA 35!**

The **NATIONAL** TRADE-MARK standardized brush
for main-drive motors

STANDARDIZED BRUSHES FOR MAIN-DRIVE MOTORS AND GENERATORS

NC NUMBER	SPECIFICATIONS	APPLICATIONS
NC 12-5610	2½ x 1¼ x ¾ Grade SA-35	For Westinghouse Tandem Holders
NC 16-5603	2½ x 1¾ x ½ Grade SA-35	For Westinghouse Tandem Holders
NC 12-4802	2¼ x 1½ x ¾ Grade SA-35	For "Toe-to-Toe" Holders
NC 16-4804	2¼ x 1½ x ½ Grade SA-35	For "Toe-to-Toe" Holders

Order by NC Number

FOR COMPLETE INFORMATION on National Carbon's brush standardization program and the advantages it offers, write to National Carbon Company, A Division of Union Carbide and Carbon Corporation, Dept. IS.

Main-drive motors and generators are the most important machines in the mill. If one of them fails, production stops dead. Tons of steel may be held up. It doesn't pay to take chances with the brushes on this vital equipment.

Here's why "National" SA-Series grades lead the field on main-drive equipment:

- Complete dependability, proved in service for many years
- Closely controlled commutation factor
- Minimum commutator wear
- Long life
- Low flat price, for one box or 10,000 boxes
- Unequalled uniformity

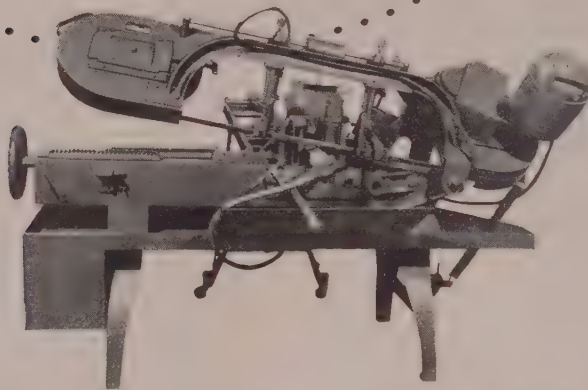
The term "National" and the Three Pyramids Device are registered trade-marks of Union Carbide and Carbon Corporation

NATIONAL CARBON COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street, New York 17, N.Y.

District Sales Offices: Atlanta, Chicago, Dallas, Kansas City, New York, Pittsburgh, San Francisco

IN CANADA: National Carbon Limited, Montreal, Toronto, Winnipeg

**Get the advantages of
AUTOMATIC BAR
STOCK CUT-OFF
at a fraction of the cost
you might expect**



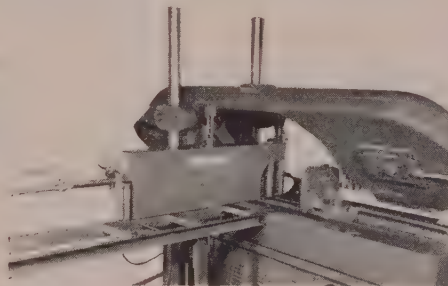
**..... with a WELLS SAW
and WELLS-O-BAR Feed Master**

A set-up for automatic repetitive cutting need not be prohibitively expensive. By combining a Wells Metal Cutting Band Saw and a Wells-O-Bar Feed Master you can automatically cut any quantity of identical lengths of bar stock with a modest investment. Or, a Wells-O-Bar Feed Master can be added to your present horizontal band saw to convert it to an automatic cut-off machine.

For operation the feed unit requires only air at 60 to 80 pounds pressure. Standard feed will project up to 17". The feed mechanism does not interfere with the use of the saw for making single cuts.

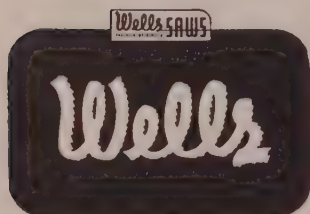
See your Wells Dealer for complete information or write direct.

The illustration above shows the Wells-O-Bar unit attached to a Wells No. 8 Saw. At the right is the unit attached to a Wells No. 12 Heavy Duty Machine.



The Pioneers of Horizontal
**METAL CUTTING
BAND SAWS**

WELLS MANUFACTURING CORPORATION
1515 FILLMORE ST., THREE RIVERS, MICHIGAN



length attached to welding tips and operates on 115v ac. Standard model includes tools and materials necessary for many type of repair.

Foil thicknesses up to 0.004 and screen wire diameters up to 0.020 can be spot welded. Complete outfit is contained in a portable carrying case which consists of a sheet steel box with lift-out tray and is equipped with a luggage-type carrying handle. Box measures 8 x 10 x 20 inches, weighing 35 pounds, with welder and tools.

Check No. 12 on Reply Card for more Details

Two Rivets at a Time

A dual Riveter that saves time and labor in assembly and riveting has been designed by Tomkins-Johnson Co., Jackson, Mich. It is equipped with 10-inch choppers and tooled to automatically feed and set two ¼-



inch diameter by ½-inch long wagon box heads rivets at a time.

Machine consists of two 8-inch model R Riveters, mounted face to face on a common base and adjustable for rivet spacings ranging from 2½ inches to 8 inches center to center. One motor drives both flywheels, which are synchronized by a combination gear and chain drive arrangement. Both clutches are tripped by solenoids, connected to a single foot switch.

Check No. 13 on Reply Card for more Details

High Capacity Humidifier

Model 30-B heavy-duty high capacity humidifier being produced by Daffin Mfg. Co., Lancaster, Pa., uses a high pressure pump which breaks up water through specially developed nozzles. Although the unit dispenses a high degree of humidification over a large area, it covers a floor area of 22 x 30 inches and is 42 inches high. Atomization capacity is in-

STEEL



SCRAP

can swing the balance

on the scales that weigh our worthiness to continue free. *So keep the scrap moving, back to the mills. Get it back to work, as fast as you can.* This is no time for idleness either of men or metals. And here at Bristol, we hope to keep just as busy as this, shoveling in the scrap that goes to produce more and more Bristol Brass sheet, rod and wire. The Bristol Brass Corporation, since 1850 in Bristol, Conn. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

"Bristol-Fashion" means Brass at its Best

creased one-third over the older model. "Water passes into the air stream by a method of compartment separation and syphoning at a discharge rate of about 1200 cubic feet of air per minute.

Humidifier is fully adjustable with moisture output adjusted to fit individual requirements. Power is supplied by a 1/2-hp electric motor and only a cold water supply and a 110 volt ac power source are required in most installations. A water drain is unnecessary because tank capacity is controlled by a float; pumping only the water to be used for air humidification.

Check No. 14 on Reply Card for more Details

Air Flow Switch

An improved vane-type pressure air flow switch for use in forced air cooling of electronic equipment is introduced by Coral Designs, division of Henry G. Dietz Co., Long Island City 2, N. Y. It is designed to operate a control relay to guard against tube failure in event of blower failure or air-passageway obstruction.

Check No. 15 on Reply Card for more Details

Gas Burning Nozzles

The new gas burning nozzles available from Hauck Mfg. Co., Brooklyn 15, N. Y., combine a flame retaining nozzle and a long sweep elbow into a single unit. It produces a long cylindrical, torch type blast flame. The unit is recommended for firing kilns, heat treating and melting furnaces, ovens, air heaters, boilers, immersion tubes and for ladle heating or drying.

Check No. 16 on Reply Card for more Details

Strap Cutting Tool

E14AO strap cutter, introduced by Acme Steel Co., Chicago 8, Ill., is designed to cut flat steel strapping up to 3/4 x 0.035-inch. A band guide prevents straps from wedging side-wise between the blades. A flat lower blade permits easy insertion beneath tensioned straps on bales, bundles and cartons.

Check No. 17 on Reply Card for more Details

Cutter Grinder Microscope

For checking radii, forms and angles of engraving tools, small twist drills and similar tools and components that carry an irregular shape at the end of a cylindrical shank, the P. G. cutter grinder microscope made by George H. Alexander Machinery Ltd., Birmingham, England, is offered by J. Arthur Deakin & Son, Jamaica 2, N. Y. It consists of a 15X magnifying microscope with detachable reticle. An adjustable microscope

tube is mounted on a vertical slide for focusing workpiece.

Check No. 18 on Reply Card for more Details

Automatic Illumination Control

Model 1089 plug-in automatic illumination control, offered by Weston Electrical Instrument Corp., Newark 5, N. J., provides completely automatic on-off control of artificial lighting at predetermined light levels. It may be plugged into a standard watt-hour meter receptacle.

Check No. 19 on Reply Card for more Details

Valve Features Babbitt Seat

Heavy duty valve No. 788, made by R-S Products Corp., Philadelphia 44, Pa., is equipped with totally enclosed gear reduction drive, extended shaft and floor stand. Sealing of water pressure is obtained by utilizing a babbitted seat in the body and Monel or stainless steel welded to the periphery of the valve disk.

Check No. 20 on Reply Card for more Details

Lightweight Dust Hood

A new lightweight dust hood is offered by Willson Products Inc., Reading, Pa., for use in atmospheres containing heavy concentrations of irritating dust. It can be used with or without a respirator by use of easily interchangeable frames and windows.

Check No. 21 on Reply Card for more Details

Direct Flow Pump

Aldrich Pump Co., Allentown, Pa., offers a 6-inch stroke direct flow pump series. It includes Triplex, Quintuplex, Septuplex and Nonuplex units having 3, 5, 7 and 9 plungers, respectively. Ranging from 300 to 900 hp, the new series covers applications such as heavy forging press service, steel mill descaling, etc. Pumps feature inverted design and direct flow fluid-end.

Check No. 22 on Reply Card for more Details

Molded Packings

Periflex Inc., Hazel Park, Mich., announces a line of molded packings for hydraulic and pneumatic equipment. They are compression molded from special fabric and neoprene compound that is resistant to a wide variety of hydraulic fluids.

Check No. 23 on Reply Card for more Details

Winding Temperature Equipment

A new line of winding temperature equipment for power transformers is announced by Transformer and Allied Product Divisions, General Electric Co., Schenectady 5, N. Y. It consists

of a Hotspot indicator-relay, Hotspot indicator for local indication and a Hotspot indicator for remote indication. All the new equipment can be removed and tested without de-energizing the transformer, lowering the oil level or in any way interfering with operation of the transformer.

Check No. 24 on Reply Card for more Details

Prime Coat for Metal

Rustygon, developed by Gensco Chemical Division, General Steel Warehouse Co. Inc., Chicago 39, Ill., is a prime coat for metal surfaces that dissolves and prevents rust. No oil is used in its manufacture and its coefficient of expansion and contraction being similar to metal permits it to move with the metal and avoids cracking and blistering. It can be applied with a rag, brush, spray or by dipping.

Check No. 25 on Reply Card for more Details

Indicates High Temperatures

Tempil Corp., New York 11, N. Y., has developed Tempilaq to indicate 2000° F. It can be obtained in 12 or 13-degree steps from 113 to 400° F and in 50-degree steps from 400 to 2000° F.

Check No. 26 on Reply Card for more Details

Synthetic Rubber Sealer

Minnesota Mining & Mfg. Co., Detroit 2, Mich., introduces EC-1055, a resilient sealing compound in extruded form which when pressed into a seam and tightened between metal surfaces, seals the joint like a rubber gasket. When heated, it swells about 50 per cent and cures to a tough flexible mass providing a sponge-rubber type of seal.

Check No. 27 on Reply Card for more Details

Monitors Speeds of Many Units

Speeds of many machines can be measured from one convenient location with the new tachometer that employs a machine selector knob. Developed by Metron Instrument Co., Denver 9, Colo., it is offered in a wide selection of over 50 standard full scale range markings.

Check No. 28 on Reply Card for more Details

FOR MORE INFORMATION

on the new products and equipment in this section, fill in a card. It will receive prompt attention.

The Metal Market

Defense mobilization requirements stimulate production of critical metals. Mineral reserves being replenished for use in future years

PRODUCTION of most of the strategic and critical metals and minerals is increasing, says Oscar L. Chapman, secretary of the interior. The principal factor in this upward trend has been a sharp upswing in the average price of metals and minerals. Another has been a feeling on the part of industry that defense mobilization will provide a sustained market.

Activities of the Defense Minerals Administration in assisting mine operators to obtain necessary supplies and equipment for maintenance, repair and operation, contributed directly to the upsurge in mine production. Effect of its other programs, including accelerated tax amortization, loans, purchase contracts and exploration assistance, has not yet been felt directly. However, knowledge that they are being undertaken has contributed to the confidence in future prospects that has led to increased exploration and development work and the stepping up of production at operating properties.

Compared with the average monthly production rates for the first quarter of 1950, May saw the output of copper up 18 per cent, of zinc up 23 per cent. Lead is the only mineral in which the Bureau of Mines collects monthly data that showed a lower production in May than the monthly average for the first quarter of 1950, a decline of 6 per cent. This decline is partly attributable to a labor dispute.

One of the important effects of the DMA program will be the replenishment of mineral reserves for future years. As a result of exploration projects carried on with government assistance, the balance between production and known reserves, which is being dangerously upset by current heavy demands, may be restored, Mr. Chapman says.

Foreign Copper Price Rises

Ceiling price on copper refined from foreign ores was raised 3 cents a pound by OPS last week. This will allow custom refiners of foreign ores to reflect in their own prices the 3-cent a pound boost recently granted to Chilean copper interests by this government. It will release substantial tonnages of foreign ore which had been withheld from the market pending an official ruling on prices. Price of copper produced from domestic ores remains at 24.50c a pound.

Reopens Cuban Nickel Plant

National Lead Co., New York, acquired a substantial interest in Nickel Processing Corp., which will operate the former Nicaro Nickel Co. property in Cuba. The mine and reduction plant will be operated under contract with General Services Admin-

istration, Washington. Sharing ownership of Nickel Processing Corp. are Tin Processing Corp., controlled by the Billiton interests, and Cuban nationals. The \$32 million plant was built with Defense Plant Corp. funds in 1942 to relieve a critical shortage of nickel. Deposits, while ample, were low-grade, causing a suspension of operations in March, 1947. Rehabilitation work is under way.

Aluminum Output Rising

Contract for electrical apparatus to be installed in the new aluminum production plant being erected at Wenatchee, Wash., by Aluminum Co. of America was awarded to Westinghouse Electric Corp., Pittsburgh. The contract, in excess of \$3 million, provides for 24 ignitron rectifiers as well as transformers and other auxiliary equipment.

The \$50 million plant being erected by Alcoa at Wenatchee will be capable of producing some 85,000 tons of aluminum annually.

In his midyear economic report to Congress, President Truman said the government's production goal includes a doubling of the 1950 aluminum output by 1953. Output of primary aluminum in 1950 totaled 718,622 tons.

National Association of Aluminum Distributors was organized to deal with the problems arising out of the phenomenally rapid growth of the

aluminum industry which started just after World War II and shows no signs of a let-up. Officers of the trade group are: Harry L. Edgcomb Jr., Edgcomb Steel Corp., Hillside, N. J., president; W. W. Doxey, T. E. Conklin Brass & Copper Co., New York, vice president; T. Stenson White, Nottingham Steel Co., Cleveland, vice president, Ralph W. Shaw Jr., A. R. Purdy Co., Lyndhurst, N. J., treasurer.

Raymond L. Collier, for the last 22 years connected with the iron and steel foundry trade associations, was appointed executive secretary.

RFC May Reduce Tin Price

Reconstruction Finance Corp. is considering another reduction in the price of tin it sells to United States industry. This was revealed by W. Stuart Symington, administrator of this government agency. He told a Senate armed services group that this country is in such a "good" tin position that RFC, the sole importer of the metal, could stop buying for a while in the world market.

NPA Rules on Zinc Shipments

Slab zinc producers are permitted to ship to their regular customers up to one-half of the amount of the same grade slab zinc which was shipped to them in July. Permission to ship in advance of issuance of August allocations was granted because of the delay in mailing notices of allocation. Any excess shipments made under this authorization will show up in the inventories of slab users and corrections will be made in subsequent allotments.



TEN-TON CASTING: About 28,000 pounds of Navy M composition (88 per cent copper, 6 tin, 4½ zinc and 1½ lead) were poured to produce this casting at the Eddystone, Pa., plant of Baldwin-Lima-Hamilton Corp. After removal of gates and risers, shipping weight was about 20,000 pounds. Almost 30,000 pounds of metal were melted for the casting in an oil-fired reverberatory furnace with a 55,000-pound capacity

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c. Conn. Valley; Lake 24.62½c. delivered.

Brass Ingots: 85-5-5-5 (No. 115) 29.00c; 88-10-2 (No. 215) 44.50c; 80-10-10 (No. 305) 35.00c; No. 1 yellow (No. 405) 25.50c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c. East St. Louis; high grade 18.55c. delivered.

Lead: Common 16.80c; chemical 16.90c; cor-rod 16.90c. St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb. c.i. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.00c; grade 2, 17.75c; grade 3, 17.25c; grade 4, 16.50c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 106.00.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.5% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9% base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, large lots, New York, \$208-\$213 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, \$1.56 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, \$2.55 del.; special or patented shapes \$2.80.

Cobalt: 97.99%, \$2.10 per lb for 500 lb (kegs); \$2.12 per lb for 100 lb (case); \$2.17 per lb under 100 lb.

Gold: U. S. Treasury, \$35 per ounce.

Silver: Open market, New York 90.16c per oz.

Platinum: \$90-93 per ounce from refineries.

Palladium: \$24 per troy ounce.

Iridium: \$200 per troy ounce.

Titanium (sponge form): \$5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; effective May 23, 1951)

Sheet: Copper 40.18; yellow brass 37.28; commercial bronze, 95% 40.18; 90% 39.78; red brass, 85% 38.86; 80% 38.47; best quality, 38.07; nickel silver, 18%, 50.99; phosphor-bronze grade A, 5%, 59.42.

Rod: Copper, hot-rolled 36.03; cold-drawn 37.28; yellow brass free cutting, 31.70; commercial bronze, 95%, 39.87; 90%, 39.47; red brass 85%, 38.55; 80%, 38.16.

Seamless Tubing: Copper 40.22; yellow brass 40.24; commercial bronze, 90%, 42.44; red brass, 85% 41.77.

Wire: Yellow brass 37.57; commercial bronze, 95%, 40.47; 90%, 40.07; red brass, 85%, 39.15; 80%, 38.76; best quality brass, 38.36.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.i. 28.67-30.295; L.C.I. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.i. 30.10, L.C.I. 30.18, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, L.C.I. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.i. orders)

Sheets and Circles: 2S and 3S mill finish c.i.

Thickness Range Inches	Widths or Diameters, in., Inc.	Flat Sheet Sheet Base*	Coiled Sheet Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.098	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.078-0.061	12-48	31.8	29.3	33.4
0.060-0.045	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	—Round—		—Hexagonal—	
	R317-T4, 17S-T4	R317-T4, 17S-T4	R317-T4, 17S-T4	17S-T4
0.125	52.0	...	...	...
0.156-0.188	44.0	...	...	...
0.219-0.313	41.5	...	...	...
0.375	40.0	46.0	48.0	...
0.406	40.0	...	...	...
0.438	40.0	46.0	48.0	...
0.469	40.0	...	...	...
0.500	40.0	46.0	48.0	...
0.531	40.0	...	...	...
0.563	40.0	...	...	45.0
0.594	40.0	...	...	...
0.625	40.0	43.5	45.0	...
0.688	40.0	...	45.0	...
0.750-1.000	39.0	41.0	42.5	...
1.063	39.0	...	41.0	...
1.125-1.500	37.5	39.5	41.0	...
1.563	37.0	...	...	...
1.625	36.5	...	39.5	...
1.688-2.000	36.5	...	...	...

LEAD
(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more \$22.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils \$22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC
Sheets, 24.50c, f.o.b. mill 36.00 lb and over. Ribbon zinc in coils, 23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.50c; over 12-in., 23.50-24.50c.

"A" NICKEL
(Base prices f.o.b. mill)
Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL
(Base prices, f.o.b. mill)
Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 53.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM
Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM
(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, \$15; sheared mill plate, \$12; strip, \$15; wire, \$10; forgings, \$6; hot-rolled and forged bars, \$6.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed. Flat untrimmed 37.69c; oval 37.19c. Cast 37.375c, delivered in eastern territory.

Copper Cyanide: 70-71% Cu, 100-lb drums 1000 lb 60.8c, under 1000 lb 62.5c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 98-98% ½-oz ball, in 200 lb drums, 1 to 900 lb 19.00c; 1000 to 19,900 lb, 18.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 29.25c; over 200 lb 28.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 68.50c; 10,000 to 30,000 lb 69.50c; 3000 to 10,000 lb, 70.50c, 500 to 3000 lb 71.50c; 100 to 500 lb, 73.50c; under 100 lb, 76.50c, f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 35.00c; 400-lb bbl, 33.00c; up to 10,000 lb, 32.50c; over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 79.20c; 100 or 350 lb drums only, 100 to 600 lb, 64.50c; 700 to 1900 lb, 62.00c; 2000 to 9900 lb, 60.20c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Clean Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	20.75
Phos. bronze, A	27.00	26.75	25.75

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group I: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 19.50; No. 1 composition borings 19.25 per lb of Cu content plus 83 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 78 cents per lb of tin content; unlined red car boxes 19.25; lined red car boxes 18.25; cocks and faucets 16.75; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Unswaged zinc dross, 12.25c; new clippings and trimmings, 14.50; engravers' and lithographers' plates, 14.50c; die cast slabs, min. 90% zinc, 12.25; old zinc scrap, 11.25c; forming and stamping dies, 11.25; new die cast scrap, 10.75; old zinc die cast radiator grills, 10.50; old die cast scrap, 9.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 17.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less, 2.25c in lots less than 15,000 lb. Used storage batteries (in boxes) drained of liquid, 6.60c for 15,000 lb or more; 6.40c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 15.25c per lb. In addition, brokerage commissions are permitted.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2S solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap: Copper-free solids, 10.00 dural type, 9.00; Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
July 2-28	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June 28-30	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June 18-27	24.50	16.80	17.50	106.00	19.00	42.00	56.50	87.75
June 15-16	24.50	16.80	17.50	111.00	19.00	42.00	56.50	87.75
June 14	24.50	16.80	17.50	118.00	19.00	42.00	56.50	87.75
June 13	24.50	16.80	17.50	123.00	19.00	42.00	56.60	87.75
June 8-12	24.50	16.80	17.50	129.00	19.00	42.00	56.50	87.75
June 7	24.50	16.80	17.50	136.00	19.00	42.00	56.50	87.75
June 1-6	24.50	16.80	17.50	136.00	19.00	42.00	56.50	90.16
June Avg.	24.50	16.80	17.50	117.962	19.00	42.00	56.50	88.492
May Avg.	24.50	16.80	17.50	139.923	19.00	42.00	50.50	90.16
Apr. Avg.	24.50	16.80	17.50	145.735	19.00	42.00	50.50	90.16

NOTE: Copper; Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Sheets, Strip . . .

Sheet and Strip Prices, Page 109 & 110

Cleveland—So much tonnage is being certified to the mills under CMP trade hopes for an easing in the supply stringency are rapidly fading. Indications are there will be a large carryover of certified tonnage into fourth quarter which, when revaluated, will necessitate rejuggling mill schedules for the last three months of the year. As things now stand, it looks as though the "free" tonnage after defense needs are cared for will be very small. Meanwhile, some easing of demand pressure is noted from certain directions. For example, stampers serving the automotive industry are not pressing for tonnage like they were some time back, reflecting the cutback in production in that industry.

Cincinnati—Orders for sheets are flooding district mills. CMP volume may be found to exceed mill allocations.

Boston—Late processing of heavy allotments under CMP with abbreviated lead-time looms for the final quarter along with complications stemming from mountains of paper work. Many CMP inquiries for this quarter have been returned to customers due to lack of mill space.

New York—Most sellers are already booked up on hot and cold-rolled sheets for October, not including many orders that clerical forces are still processing. Surprise is expressed over a spurt in rated orders for cold rolled steel. Apparently Washington has been issuing tickets liberally for this material and consumers are wasting no time getting orders scheduled.

Mills report many requests for tonnage from other than regular customers, and there is nothing they can do but accept them provided they have tonnage left within the limits of their prescribed set-asides. In various instances, too, sellers believe CMP certificates call for more tonnage than consumers actually require.

Philadelphia—Galvanized sheet supply appears completely sold out for the final quarter. One large producer is sold up for the period on hot sheets, and is almost out of the market on cold sheets. Many buyers have placed orders up to 70 per cent of current quarter allotments.

Pittsburgh—Consumer estimates of sheet needs for third quarter were in excess of the tonnage actually required. Over-allocation is a serious problem. Fourth quarter tonnage is about fully booked for most mills. Despite 70 per cent reduction on third quarter estimates for fourth quarter delivery there appears to be over-allocation. This will result in heavy carryover at most mills. Obvious result is decreased tonnage for non-rated users.

Los Angeles—Fabricators' third quarter flat-rolled steel receipts, in some cases, will be 35 per cent less than requirements.

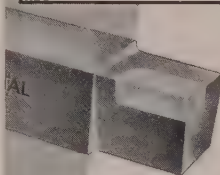
Wire . . .

Wire Prices, Page 111

New York—Some wire sellers report the slight cutback in automotive demand is not as large as they had

How to CONSERVE

Grinding Wheels and Operator Time



Conservation of materials and manpower, always essential, becomes imperative in times of emergency. Marked savings in equipment and labor required for maintenance operations are readily effected by using metal-cutting tools that stay sharp longer. The full significance of this obvious fact is perhaps not fully realized.

Kennametal tools, for example, work more hours per day, spend less time in the grinding room, and thus help sustain machine productivity, make operators more efficient, and reduce inventory. On important jobs they have demonstrated an ability to do up to four times as much machining per unit of carbide consumed.

This superior performance results from a unique coordination of manufacture and an all-inclusive control of properties—from raw materials to finished product.

Kennametal Inc., in its own plant, refines all carbides directly from ores, oxides, and by-products; processes these carbides into Kennametal compositions by means of exclusive methods and patented techniques; and fabricates complete tool and wear-part designs that utilize the distinctively uniform combination of hardness, strength, and wearability inherent in Kennametal. Outstanding among these efficient application developments is the mechanically-held technique, in which we pioneered.

A sure means to prevent waste of man-hours and equipment, therefore, is Kennametal tooling.

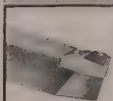
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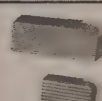
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U-S-S MULTIGRIP FLOOR PLATE

1-973

UNITED STATES STEEL

anticipated. Expectation is cutbacks will be heavier as production limitations have more telling effect. In general, demand is strong, with wire producers receiving substantial tonnages for fourth quarter shipment.

Chicago—Demand for nails exceeds supply. Requirements for barbed wire are strong. Jobbers and mills are receiving emergency calls for both barbed wire and fencing from the Missouri-Kansas flood area.

Plates . . .

Plate Prices, Page 109

Philadelphia—One leading plate producer is booked through December on sheared plate, but has capacity left for November and December on universal and strip plate. According to government sources, demand for more than 3 million tons for fourth quarter will exceed supply by close to 600,000 tons.

Boston—Although plate mills are booked through fourth quarter with directive or potential controlled volume, consumers are still trying to place orders for September delivery.

Pittsburgh—Producers continually turn away orders for plates. Fabricators apparently expect the mills to find loopholes in the directive system. If you don't have a certificate you don't get plates. Demand runs high for both light and heavy plates with no civilian production available in September and outlook for fourth quarter equally dim.

Steel Bars . . .

Bar Prices, Page 109

Pittsburgh—Bars remain in most critical supply in this area. Hot-rolled will go to defense at a rate of about 90 per cent of mill output, far over the NPA specified minimum of 78 per cent for September. Word on cold-finished sets September minimum at 75 per cent with hot-rolled alloy bars, including projectile and shell quality, at 85 per cent and cold-finished alloy bars at 75 per cent of production.

New York—CMP orders for carbon bars are being received by the mills at a rate which has already well taken up a substantial part of fourth quarter capacity. On some smaller sizes producers haven't any tonnage available for shipment before late November. There are still a number of orders being processed by clerical staffs which will account for further extension of promises. It is believed there are far more CMP tickets than there is available supply.

Boston—Limited open volume of hot-rolled carbon bars for October may be reduced when fourth quarter allotments show up in orders. Alloys are tight. Even with melt sheets approved after frequent adjustments, producers are hampered by lack of alloying elements.

Philadelphia—On some of the smaller sizes of bars, as well as on some of the larger shell sizes, producers are practically booked up for the remainder of the year.

Cleveland—Supply stringency in bars is worse than ever with the mills being flooded with CMP certificates far exceeding not only their mandatory set-aside tonnage, but their capacity as well. Numerous orders

are being turned away by the mills. Until such time as CMP certificates are more closely aligned with anticipated production there is little likelihood of anything approaching order being re-established in this market.

Chicago—Most mills have fairly well scheduled their October production schedules despite the fact 45 days lead-time is two weeks away. It was possible to do this because requested tonnage considerably exceeds set-asides for rated use. Substantial amounts will have to be turned back.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 109

Los Angeles—Inability to get steel coupled with higher construction costs, up 240 per cent since 1940, is hampering fabricators in bidding on municipal and state government construction.

Tubular Goods . . .

Tubular Goods Prices, Page 113

Boston—Buttweld pipe stocks of distributors are building up but most sellers are over-committed on seamless. Numerous third quarter CMP orders have been moved into fourth quarter with buyers given seven days to revalidate. Most tubing specialties will be retained in September schedules but some merchant steel pipe volume may be pushed out.

Structural Shapes . . .

Structural Shape Prices, Page 109

Boston—Conversion of rated orders to CMP was too much for structural mills this quarter. No easing is in sight for fourth quarter with structural shop backlogs well extended. These will be subject to adjustments with direct defense construction getting first call. New bridge inquiry includes another section, Fall River, Mass., expressway. One 15,000 ton superstructure contract will be re-advertised.

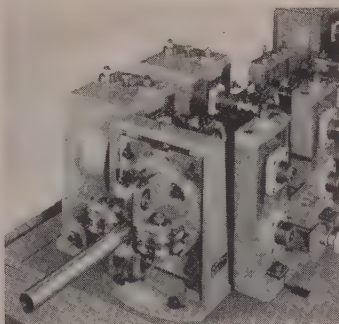
New York—Fabricated steel bookings in June, totaling 207,966 tons, dropped 22 per cent from the preceding month, but were 6 per cent greater than the same month for the average four years, 1947-1950. Bookings for first half of this year amounted to 1,728,794 tons, increase of 34 per cent over the corresponding 1950 period.

June shipments were 257,066 tons, highest for the year to date. Shipments for the first six months were 1,370,372 tons, increase of 28 per cent over last year.

Philadelphia—Fourth quarter shape tonnage is piling in on the mills rapidly. Practically all shape capacity for the quarter will be soon absorbed.

Pittsburgh—Fourth quarter structural bookings are just about complete. Supply outlook for non-rated users is bleak with an expected 98 per cent of September production going for defense. Industrial construction here is feeling the supply pinch.

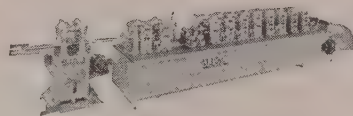
Los Angeles—Heavy west coast construction, coupled with shortage of shapes, has boosted prices and lengthened delivery dates from premium-price sources.



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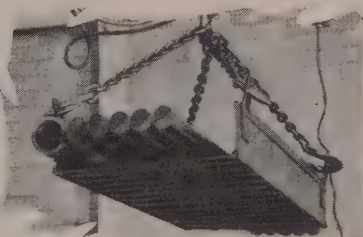
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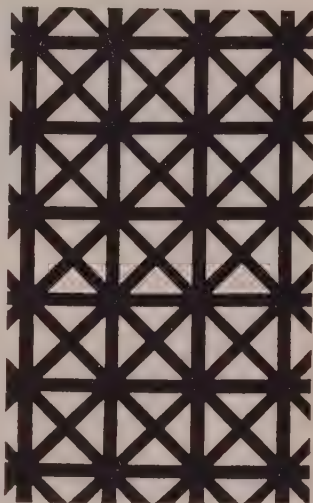
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Tool Steel Prices Advance

Washington — Ceiling prices advanced last week on high-speed tool steels, specialty steels containing tungsten, hard-facing products containing tungsten, and pure tungsten and thoriated tungsten products. OPS permitted manufacturers to recover part of the substantial increase in cost of raw materials going into these products.

Raw materials such as tungsten concentrates, ferrotungsten, and tungsten powder constitute one of the chief cost elements in the manufacture of these products, accounting for 15 to 60 per cent of their selling prices. Prices paid for these principal raw materials have increased from 45 to 120 per cent since the GCPR was issued Jan. 26.

Resellers covered by Supplementary Regulation 42 are permitted to adjust ceiling prices by the dollars-and-cents amount of the increase granted manufacturers. Price adjustments are made on the basis of GCPR prices plus applicable amounts set forth in SR 42. As an example, 1.50 cents for each 1 per cent of tungsten content for each pound of product may be added to the price of high speed tool steels and specialty steels containing tungsten; 2.05 cents for each 1 per cent of tungsten content for each pound of product may be added to the price of hard-facing products.

Tool Steel . . .

Tool Steel Prices, Page 111

Pittsburgh—Prices on high speed and tool steels containing tungsten were raised by Jessop Steel Co. and Firth Sterling Steel & Carbide Corp. last week in line with ceiling price supplementary regulation No. 42 allowing increases to offset higher cost of tungsten.

Regulation 42 permits raising prices 1½¢ per pound for each percentage point of tungsten over 1 per cent. This action increases price of standard tungsten-type high speed steel (18-4-1) 27¢ per pound and of molybdenum-type (6-6-2) 9½¢ per pound, 6-6-2 grade usually averaging 6¼¢ per cent tungsten.

Pig Iron . . .

Pig Iron Prices, Page 108

New York—Through continued liberal use of scrap, district foundries are able to make pig iron supply meet their more urgent requirements. Few melters have much, if any, iron inventory on hand despite the fact many arranged to take in shipments while closed for mass vacations. These suspensions came early in the month largely. The smaller of two blast furnaces at Swedeland, Pa., is expected to get back in operation within a week or so, but will have little foundry iron available in August due to the necessity of turning out basic for its affiliated steel mill at Conshohocken, Pa.

Boston—Pressure for iron has eased slightly, a decline in orders accompanying plant vacation closings. Exceptions are shops supplying machine tool castings. Total volume of defense work in this district is not much beyond 40 per cent.

Buffalo—Tightness continues to grip the merchant iron market. Only

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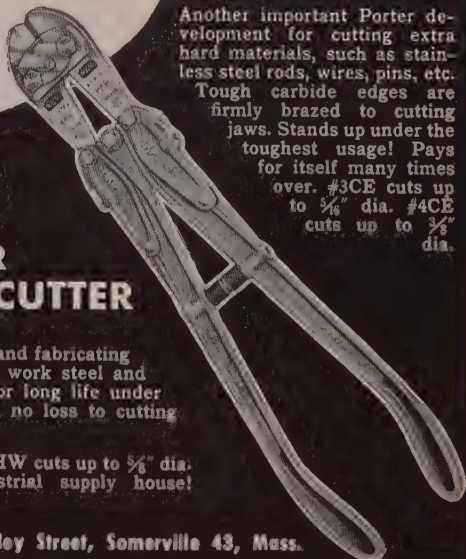
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a minor part of the total tonnage now produced by steelmakers is going into the merchant market. Motor and building equipment casters are taking large tonnages. Production holds at 100 per cent of capacity.

Philadelphia—Although domestic iron is in short supply, consumers are showing resistance to foreign offerings, and foreign prices appear softening a bit. One interest is asking \$80 f.o.b. seaboard, for basic but says it is willing to negotiate. Recently some 6000 tons were purchased by an eastern mill through a combination of barter arrangements which brought the price down to around \$70, f.o.b. eastern seaboard.

Pittsburgh—Fifty-two of the district's 54 stacks are in blast as Crucible Steel Co.'s Midland plant put a repaired blast furnace back in operation late last week. Rated orders swamp the lone merchant producer here. U. S. Steel's No. 1 furnace at the Clairton Works was blown out for patching. It has an annual capacity of 321,100 net tons of iron.

Cleveland—Increasing pressure for pig iron on military and related defense account is anticipated. This, of course, means less tonnage will be available for normal merchant consumption. Adding to the bleak supply outlook, one stack of an important producer for the merchant market here is scheduled to go down for extensive repairs in September.

Chicago—Vacation closings of many foundries are temporarily relieving the strain on pig iron although allotments from sellers are being taken in during these down periods.

Los Angeles—Pig iron shortage is eased by improved receipts from the St. Louis area. Foundries' backlog of defense orders are higher by 50 per cent.

Scrap . . .

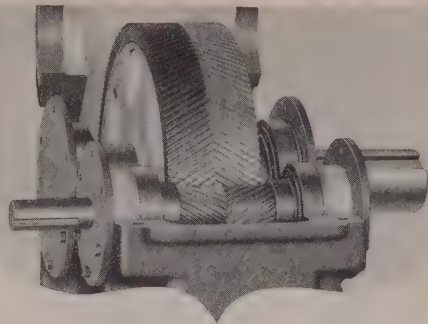
Scrap Prices, Page 116

Pittsburgh—Allocation of scrap in major industrial areas surrounding Pittsburgh hamper movement into the mills here. Generation of scrap has never matched consumption and the area must rely on outside shipments. Allocation of scrap produced here is prevalent; railroad scrap and major industrial scrap are allocated and there have been some instances of allocation of yard scrap.

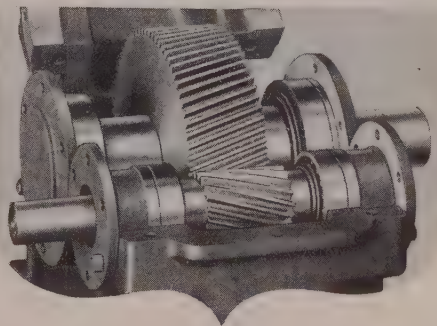
Boston—Vacation suspensions at steel mills are over, and, while scrap was taken in during the interim, heavier progress was made building inventories. The average is about three weeks. Allocations help some consumers but directives on yards are limited. Cast demand has ceased lightly with consumers more particular as to grading.

New York—Although steel scrap is as scarce as ever cast grades are relatively easy compared with a month ago. Expectation is there will be no real dearth of cast over coming weeks, unless further stringency in pig iron develops. Little improvement is expected in supply of steel grades before fall.

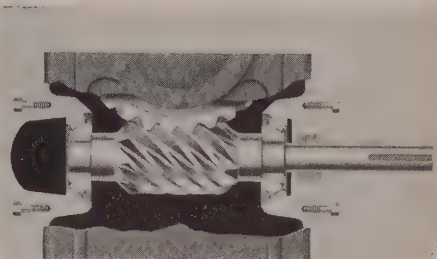
Buffalo—Reserve stockpiles of mills are slowly being rebuilt as sustained heavy volume of scrap is coming into the area from other points under allocations. Improvement is reported



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also in collections at dealers' yards. Better quality scrap would be welcome. Rejections, however, are limited.

Philadelphia—Leading sellers of steel scrap believe July will mark the low point in scrap collections. However, supply is expected to remain tight indefinitely. Cast grades continue in better supply than steel scrap, although as more foundries get back into operation, following vacations, demand should stiffen shortly.

Midvale Co. is suspending for mass vacations during the first two full weeks in August and is holding up all raw material shipments, effective Aug. 4.

Cincinnati—Only through allocations are district steelmakers enabled to obtain adequate scrap iron and steel for current needs.

Detroit—Dealer scrap allocation in Detroit is believed a logical step to make sure mills get fair treatment. Electric furnace operators are seen in need of allocation help. The scrap drive is gathering a little momentum.

Chicago—Consumers are unable to improve inventories despite substantial receipts. Inventories at mills range from 6 to 14 days. Virtually all are receiving allocations. Some easing in demand for blast furnace grades is observed as a second of the district's 42 blast furnaces is scheduled to go down Aug. 1.

Vancouver, B. C.—In spite of embargoes on scrap, supplies are far below current demands. Every effort is being made to augment shipments and increase inventories. Buyers are combing every possible source. Consumers have extended their buying territory beyond Alberta into Saskatchewan in their scramble for material. East of this line, shipments move to Manitoba. One local firm is dismantling an old smelter at Anyox, B. C. from which 6000 tons will be obtained.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 113

Cleveland—Operations are off as much as 30 per cent at some industrial fastener plants. This partly reflects the usual summer slackening in activity including curtailments for vacations. But lack of steel is an important factor. Fastener producers have worked off most of their steel inventories and are virtually dependent on prompt mill shipments. These they are not receiving. One plant which ordinarily would consider a 10,000 ton inventory as low was down to a stock of 260 tons recently and expected little improvement soon.

Iron Ore . . .

Iron Ore Prices, Page 115

Cleveland—Shipments of Lake Superior iron ore increased to a record high for the season to date in the week ended July 23, amounting to 3,196,323 tons. Average daily loading rate was 445,319 tons from United States ports alone. This brought the season's cumulative total to 41,820,944 tons, increase of 36 per cent over that for the like 1950 period, according to Lake Superior Iron Ore Association.

Warehouse . . .

Warehouse Prices, Page 115

Cleveland—Demand pressure on the warehouses continues strong though some seasonal easing is noticeable. Vacation curtailments and slackening in the automotive industry are important influences affecting market activity at the moment. However, business volume of most distributors would be substantially larger were inventories adequate to fill all requests coming to them. Although the warehouses expect to get their full mill allotments up to 85 per cent of their receipts in the base period, indications are total warehouse receipts will be down from earlier in the year because of the drying up of "free" tonnage heretofore available in substantial quantities. With the mills virtually committed to capacity in the major products on CMP certificates, indications are the "free" tonnage in the market will be pitifully small.

New York—While July warehouse business is expected to be down somewhat from June, much depends on receipts from mills which are the real bottleneck. If it develops there has been a real spurt during the closing days of the month it is just possible business this month may be comparable with that in June. Over the past week or so there has been an improvement in mill receipts. Usually there is a marked jump in volume of incoming mill tonnage toward the close of the month. Mass vacations at various consuming plants have



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caused some restriction in demand, but even so inquiry is heavier than warehouses can supply with present inventories.

Boston—Most distributors are getting a substantial part of their carbon steel allocation. Demand is in excess of incoming volume and inventories are unbalanced. Tool steel stocks are more in line with demand, but overall stocks are about one-third normal.

Philadelphia—While mill shipments have been coming in at an appreciably faster pace, most warehouses estimate that July business will be off from the preceding month. Demand is less pressing because of mass vacations.

Pittsburgh—Little change is observed in high demand for distributor items here. Receipts are in line with NPA regulations but demand far exceeds supply.

Los Angeles—Purchases of warehouse steel by manufacturers of non-defense products are falling.

Warehouses Get Stainless

Washington — Steelmakers have been notified by telegram to set aside percentages of certain stainless steel and alloy steel products for warehouse and converter customers.

Up to this time the producers have been required to reserve only portions of their carbon steel output for these customers.

The set-asides are expressed as percentages of a steelmaker's average monthly shipments to converters and warehouses in the base period, Jan. 1 to Sept. 30, 1950. Converter set-asides are as follows: Stainless steel products, except tubing, with not less than 15 per cent in nickel grades, 85 per cent; stainless steel tubing with at least 80 per cent in nickel grades, 85 per cent; alloy cold-drawn bars with not less than 25 per cent in nickel grades, 100 per cent; all other alloy products with not less than 20 per cent in nickel grades, 100 per cent.

Set-asides for warehouses are: Stainless steel products, except tubing, with at least 15 per cent in nickel grades, 85 per cent; stainless tubing with 80 per cent in nickel grades, 85 per cent; commercial quality alloy steel in any grades containing specified percentages of nickel, molybdenum and chrome, 100 per cent.

Canada . . .

Toronto, Ont.—There is little prospect for any betterment in Canada's steel supply this year, Drummond, McCall & Co., steel warehouse operators, report. Every Canadian producer has a substantial expansion program under way but the added tonnage is not expected to ease the situation to any large extent.

Despite the fact that Canada's production and imports this year will reach 4,500,000 tons, an all time high, serious shortages continue.

Toronto, Ont.—Steel prices in Canada have been marked up \$5 per net ton to make new prices at Hamilton as follows: Steel bars, base, \$4.40; steel plates, \$4.60; cold-rolled sheets, \$5.30, and hot-rolled sheets, \$4.35 per 100 pounds. No change was made in galvanized sheets which are quoted at \$6.25 per 100 pounds.

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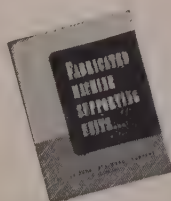
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4500 tons, warehouses, U. S. Army Engineers, Tobyhanna, Pa., to Mt. Vernon Bridge Co., Mt. Vernon, O.

600 tons, two Congress street overpasses of 300 tons each, Chicago, to American Bridge Co., Pittsburgh; Thomas McQueen, Forest Park, Ill., contractor.

600 tons, addition to Rock Island dam, Columbia river, to Mississippi Valley Structural Steel Co., St. Louis.

500 tons or more, gate heads, stop logs and other equipment, Rock Island dam addition, to Consolidated Western Steel Corp., Seattle.

200 tons, library, Georgia School of Technology, Atlanta, to Bristol Steel & Iron Co., Bristol, Va.; J. A. Jones Construction Co., Atlanta, general contractor.

135 tons, school building, Quincy, Mass., to Grossier & Shlager Iron Works, Somerville, Mass.; S. & A. Allen Construction Co., Boston, general contractor.

100 tons plus, crest gates, latches and frames, Rock Island dam addition, to Moore Drydock Co., Oakland, Calif.

STRUCTURAL STEEL PENDING

15,000 tons, Boston connection, part one, superstructure, Central Artery, Boston; rejected, to be readvertised.

5000 tons, Du Pont nylon plant, near Pensacola, Fla.; bids closed July 25.

4500 tons, Forest Hills overpass, Roxbury district, Boston; bids Aug. 2, Metropolitan District Commission, Boston.

1600 tons, power station, Hartford, Conn., Electric Light Co.; Stone & Webster Engineering Corp., engineer-contractor.

500 tons, Mores Creek highway bridge, Boise county, Idaho, railroad relocation project Lucky Peak dam job; general contract to Roy L. Blair & Co., Spokane, Wash., by U. S. Engineer, Walla Walla, Wash.

245 tons, tower repairs, Delaware Memorial bridge, Wilmington, Del.; bids Aug. 9.

150 tons plus, reinforcing and steel piling also involved, railroad bridge and overpass, Walula, Wash.; J. A. Terteling & Sons Inc., Boise, Idaho, low to U. S. engineer.

REINFORCING BARS . . .**REINFORCING BARS PLACED**

565 tons, library, Georgia School of Technology, Atlanta, to Hall Steel Co., Atlanta; J. A. Jones Construction Co., Atlanta, general contractor.

350 tons, State Library of Hygiene, University of Wisconsin, Madison, Wis., to United States Steel Supply Co., Chicago.

350 tons, including 203 tons in storm sewer and 150 tons in pumping station, Congress street expressway, Chicago, to United States Steel Supply Co., Chicago; S. A. Healy Co., Chicago, contractor.

170 tons, research laboratory, building No. 330, Argonne National Laboratory, DuPage county, Illinois, to Bethlehem Steel Co.; S. N. Nielsen Co., Chicago, contractor.

149 tons, St. Francis Borgia school, Chicago, to Olney J. Dean Steel Co., Chicago; Montague Construction Co., Chicago, contractor.

55 tons, school building, Quincy, Mass., to Concrete Steel Co., Boston; S. & A. Allen Construction Co., Boston, general contractor.

REINFORCING BARS PENDING

2900 tons, jet engine plant, Buick Division, General Motors Corp., Willow Springs, Ill.

890 tons, substructure, Clinic building, Henry Ford hospital, Detroit.

635 tons, Southern Wisconsin Colony Training school, Union Grove, Wis.

600 tons, expansion, Solar Aircraft Co., Des Moines, Iowa.

600 tons, National Petro-Chemicals Corp., Tuscola, Ill.

395 tons, flood protection, Sec. 2, New Albany, Ind.

260 tons, Fenwick high school, Oak Park, Ill.

250 tons, 20-mile section, Potholes East canal, Columbia Basin project; bids to Bureau of Reclamation, Ephrata, Wash., Aug. 8.

209 tons, including 180 tons of bars and 29 tons of joists, residence units, Mentally Sick

Children, Institute for Juvenile Research, Chicago; bids of June 12 rejected.

185 tons, waterworks improvement, Evergreen Park, Ill.

150 tons, expansion, Whirlpool Corp., Laporte, Ind.

110 tons, Pittman Square school, Gary, Ind.

100 tons, Community hospital, Evanston, Ill.; Charles B. Johnson & Sons Inc., Chicago, contractor.

PLATES . . .**PLATES PENDING**

Unstated tonnage, 150,000-gallon steel water storage tank, Orange Farm, Florida, N. Y.; Hammond Iron Works, Warren, Pa., low.

RAILS, CARS . . .**LOCOMOTIVES PLACED**

Canadian National Railways, three 1200 hp diesel-electric locomotives, to General Motors Ltd., London, Ont.; one 1000 hp diesel-electric switcher, to American Locomotive Co., New York.

RAILROAD CARS PLACED

Atchison, Topeka & Santa Fe, 200 seventy-ton tank cars, to unnamed builders.

Canadian National Railways, 4305 freight cars, divided between Canadian Car & Foundry Co., Eastern Car Co. and National Steel Car Co.

Chicago, Indianapolis & Louisville, 250 fifty-ton box cars, to Pullman-Standard Car Mfg. Co., Chicago.

Chicago & Northwestern, 250 seventy-ton covered hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

Delaware, Lackawanna & Western, 100 seventy-ton covered hopper cars, to American Car & Foundry Co., New York.

Grand Trunk Western, 250 fifty-ton box cars, to American Car & Foundry Co., New York, and 250 seventy-ton triple hopper cars, to General American Transportation Corp., Chicago.

Union Pacific, 100 steel caboose cars, to its Omaha, Nebr., shops.



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Carboloy Offers New Line

A line of standardized twist drill tips for cast iron drilling is added to the line of blanks carried in stock by Carboloy Department, General Electric Co., Detroit. Decision to take this action reflects recent developments in the techniques of drilling cast iron with carbide tipped twist drills and the resultant increasing demand for such twist drills. Standard twist drill tips for drilling nonferrous materials are also carried in stock in 23 sizes.

Lewis Welding Buys Rights

Rights to exclusive sale and manufacture of MacRay 4-ounce plastic injection molding machine were purchased by Lewis Welding & Engineering Corp., Bedford, O. from MacRay Engineering Co., Cleveland.

Plans \$500,000 Addition

Construction of a \$500,000 addition to the plant of Electric Hose & Rubber Co., Wilmington, Del., has been started.

Swaging Services Offered

Hero Mfg. Co., Middleboro, Mass., manufacturer of knitting needles, made a change in their swaging department policy. All of their facilities for the precision high-speed swaging of metal rods and tubes are now available for any interested manufacturer.

Ohler Mfg. Co. Expands

Ohler Mfg. Co. Inc., Baltimore, is erecting an addition of several thousand square feet, doubling its present space. The company has secured some defense work. In addition to general machine shop work, it makes special tools and dies, machine parts and specializes in precision work.

Skirvin Moves to New Plant

Skirvin Tool & Engineering Co. Inc. moved to its new plant at 3448 Shelby St., Indianapolis.

Goodrich Expands Plant

Another major expansion of the Miami, Okla., tire and tube plant of B. F. Goodrich Co., the third since 1946, is announced by Walter E. Head, plant manager. Construction work will be undertaken as rapidly as building materials are available. The addition will add 60,000 square feet of manufacturing space and 50,000 square feet for storage and handling of raw materials and finished goods. With

the latest addition, the plant will have nearly 1 million square feet of floor space and will produce about 500,000 pounds of finished goods daily.

Monsanto Awards Contracts

Monsanto Chemical Co., St. Louis, awarded contracts for the design and construction of a multimillion dollar elemental phosphorous plant in Soda Springs, Idaho, to H. K. Ferguson Co., Cleveland, and Morrison-Knudsen Co., Boise, Idaho. Purchase of materials and equipment will be handled by Ferguson.

Will Reopen Iliion Plants

Remington Arms Co. Inc., Bridgeport, Conn., will reopen three idle buildings at Iliion, N. Y., for production under a \$4.5 million government contract to set up assembly lines for small arms parts.

Crane Packing to Build

Crane Packing Co., Chicago, will erect a \$420,000 factory and office building in Morton Grove, Ill. The company manufactures packings, mechanical seals, precision lapping machines, pipe thread and gasket compounds.

Allis Chalmers Names Agents

Allis-Chalmers Mfg. Co., Milwaukee, appointed Tools & Supplies Inc., St. Louis, and Independent Distributing Co., St. Joseph, Mo., as distributors for its Tex-rope drive equipment.

John W. Metcalfe Co.

John W. Metcalfe, formerly associated with Bethlehem Steel Co. and more recently with Keystone Fabricating Co., organized the John W. Metcalfe Co., offering engineering drafting and structural steel detail drawings. Office and drafting rooms are located in the Bessemer Bldg., Pittsburgh.

Buys Steel Rolling Mill

Remington Rand Corp., Buffalo, purchased the R. W. Head Co. steel rolling mill in Ithaca, N. Y. It will roll special steel strips and shapes for the parent company.

Abrasive Firm Expands Plant

A \$1.2 million expansion program by Bay State Abrasive Products Co., Westboro, Mass., was approved by NPA. Certificates of necessity have been issued and construction work started. Of the total, about \$700,000 will be devoted to extension

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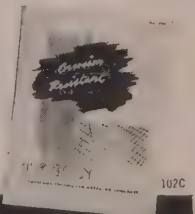
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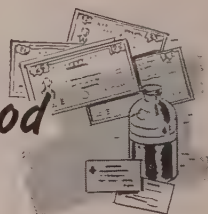
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CLAYMONT STEEL CORPORATION, Claymont, Del.
THE CALIFORNIA WIRE CLOTH CORPORATION, Oakland, Calif.
WICKWIRE SPENCER STEEL DIVISION, New York, N.Y.



STEEL

of present factory and storage buildings. The balance is to be used to purchase new equipment, including a high-temperature tunnel kiln.

Buils Electroplating Unit

Western Electric Co., Baltimore, completed a new electroplating unit at its Point Breeze plant. Copper, tin, zinc or nickel finishes are applied to about 350 different piece parts having a total weight of 1,250,000 pounds per year, and varying in size from 6000 parts to the pound to items of 3.25 pounds each.

Babcock & Wilcox Co. Moves

Babcock & Wilcox Co.—steam generators and related equipment—leased five floors in the Chrysler Bldg. East, New York, totaling about 120,000 square feet. Sales offices of Babcock & Wilcox Tube Co., a subsidiary, presently located at 22 E. 40th St., New York, will also be moved into the Chrysler Bldg., East.

Toro Purchases Mooers Co.

Toro Mfg. Co., Minneapolis, purchased the plant and facilities of Mooers Co., Windom, Minn. Toro will transfer its manufacture of power mowers and machine tools from Minneapolis to Windom this fall.

Dunham Builds Shell Plant

C. A. Dunham Co., Chicago, is constructing an addition to its plant in Michigan City, Ind. This manufacturer of heating systems and equipment will use the new facilities to produce high explosive artillery shells for the military services on a \$9 million defense contract.

Bids Low on Laboratory

S. N. Nielsen Co., Chicago, submitted the lowest bid, \$1,049,000, for the construction of a research laboratory building in Lemont, Ill., for the United States Atomic Commission, Washington.

Appoints Venezuelan Agent

United States Air Conditioning Corp., Minneapolis, appointed P. C. Bousquet G. & Co. and Stolk & Bosquet, Caracas, Venezuela, as representatives and distributors of its air conditioning, heating and ventilating equipment in that country.

Buys Hardy Instrument Co.

International Resistance Co. purchased Hardy Instrument Co., Forest Hills, L. I., and Long Island City, N. Y. All operations of the company will be transferred to the Specialty Division, International Resistance Co., at 401 N. Broad St., Philadelphia.

Norman Hardy, founder of the organization, joined the IRC staff as sales engineer while Benjamin Solow, chief engineer and associate of Mr. Hardy, is currently employed by IRC to continue development and product design on selenium rectifiers and their applications.

Burroughs Buys Firm

Burroughs Adding Machine Co., Detroit, purchased Control Instrument Co. Inc., Brooklyn, N. Y., designer and manufacturer of electronic instruments and fire control devices for the Navy. Control Instrument will continue, as a separate corporation, to use its facilities for defense production in this field. John J. Hyland will continue as president of the Brooklyn firm.

Plans \$3 Million Plant

Vickers Inc., Detroit, will build a \$3 million plant for the manufacture of hydraulic equipment in Joplin, Mo. The factory will contain 100,000 square feet of floor space.

Youngstown Awards Contra

Youngstown Sheet & Tube Co., Youngstown, awarded Salem Engineering Division of Salem-Brosius Inc. a contract for design and erection of a triple-fired pusher type slab heating furnace at the company's Indiana Harbor, Ind., Works. Erection is scheduled to get under way in the first quarter of 1952.

Cylinder Maker Builds Plant

Miller Motor Co., Chicago, manufacturer of air and hydraulic cylinders, built a plant with about 50,000 square feet of floor space at Melrose Park, Ill.

Thompson Trailer Expands

Thompson Trailer Corp., Pikesville, Md., awarded a contract for a 30,000 square foot addition which will double the company's floor space. Thompson manufactures aluminum commercial trailers; the expansion is in connection with aluminum fabrication for electronic parts.

Will Make Jet Engine Parts

Cockshutt Plow Co., Brantford, Ont., as licensee in Canada for the British firm of John Lucas & Co., will assume operation management of the Canadian government-owned plant at Renfrew to manufacture the combustion unit for the Orinda jet engine. It is expected the plant will be in operation next September. The government purchased the plant from Renfrew Machinery Co. several weeks ago and is making all capi-



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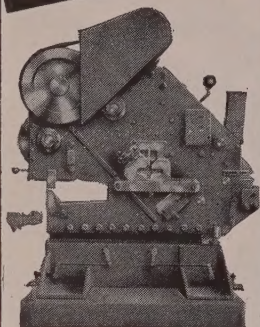
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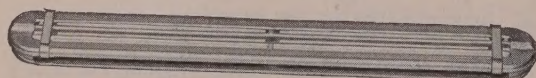
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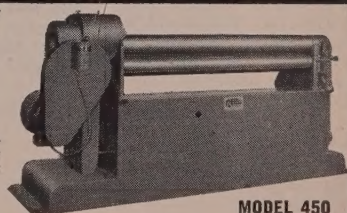
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al expenditures and holding full title to the plant and equipment. Cockshutt Co. will operate it on a straight management basis. The combustion or fuel systems for the jet engines are turned out as a unit, and already are being produced in Brantford.

Closes Sulphuric Acid Plant

E. I. du Pont de Nemours & Co., Wilmington, Del., closed its sulphuric acid plant at Niles, O., and plans to dismantle it. The shutdown is attributed to the shortage of sulphur and inability to operate the plant economically.

Press Manufacturer Expands

Clearing Machine Corp., Chicago, awarded the general contract for erection of a \$350,000 factory building in Joliet, Ill., to Abell-Howe Co., Chicago. The company produces presses and pneumatic cushions for die presses.

Gregory Industries Inc.

Morton-Gregory Corp., Toledo, O., changed its name to Gregory Industries Inc. Principal interest of the corporation is the Nelson Stud Welding Division, Lorain, O., producer of fasteners and equipment.

Vestinghouse Builds Plant

Construction of a plant at Far Madison, Ind., which will increase its headlight manufacturing facilities by 10 per cent, is planned by Vestinghouse Electric Corp. Opening of the plant is scheduled tentatively for mid-1952.

Pump Maker Buys Factory

E. C. Brown Co., spray pump manufacturer, sold its building at 845 Maple St., Rochester, N. Y., to the Roseaf Corp., that city, for a reported price of \$320,000. The Brown concern plans to relocate as soon as possible.

Tomke Aluminum Expands

Tomke Aluminum Division, United Iron & Metal Co. Inc., Baltimore—aluminum ingots, etc.—awarded a contract for an addition to its storage building. Jacob S. Shapiro is president.

Purchases Canadian Plant

Sterling Factories, Erie, Pa., purchased a plant in Port Erie, Ont., which will provide Sterling with supplies of aluminum. While Canadian law forbids the export of raw aluminum sheets, it allows export of aluminum which has undergone some manufactured process. It is expected the Port Erie plant will perform preliminary manufacturing operations on the alu-

minum and ship it to Erie to be finished.

Opens New England Office

Phelps Dodge Copper Products Corp., New York, established a New England sales office at 828 Statler Office Bldg., Boston. Craig W. Marshall, general accounts, and Frank A. Stevens Jr., utilities, will make their headquarters at this office. Warehouse facilities for the company will be continued at 143 Sidney St., Cambridge, Mass.

Ampco Appoints Distributor

Ampco Metal Inc., Milwaukee, appointed R. J. Greer Equipment Co., Syracuse, N. Y., as distributor for its line of resistance welding electrodes.

Plans \$8 Million Plant

Facilities for production of graphite electrodes will be constructed by International Graphite & Electrode Corp., Niagara Falls, N. Y. Cost is estimated in excess of \$8 million.

Will Make Tubing in Ohio

Superior Tube Co., Norristown, Pa., purchased a building containing 15,000 square feet of floor space in Wapakoneta, O. Operations in the plant are expected to start in December. Production will consist of seamless nickel cathodes for the electronics industry and stainless steel hypodermic needle tubing.

Atlas Builds Large Plant

Atlas Powder Co., Wilmington, Del., will build a \$1,531,000 plant at Atlas Point, Md., for the manufacture of sorbitol.

Bacon Felt Completes Move

Bacon Felt Co. transferred all its activities to its new Taunton, Mass., factory where it recently moved from Winchester, Mass.

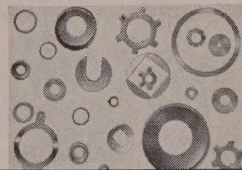
File Incorporation Papers

Charters of incorporation were filed with the secretary of state's office, Dover, Del., by: Metalweld Inc., with Corporation Service Co., Wilmington, serving as principal office; Federal Export & Import Co.—machinery and equipment—with Tax Research Bureau Inc., Wilmington, serving as principal office; National Resources Corp.—metals—with Registrar & Transfer Co., Dover, Del., serving as principal office; B. & G. Olsen Co. Inc.—machinery—with Corporation Trust Co., Wilmington, serving as the principal office; Research Development Manufacture Inc.—machinery—with Corporation Guarantee & Trust Co., Wilmington, serving as the principal office.



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